StarACS

User Manual

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Device Dependent Parameters Section 13	Revised	SW version 2.8 September 2009

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1. StarACS Overview

This document describes using the StarACS Admin CPE Remote Management application. This product enables the administrator to manage, monitor, and diagnose customer premises equipment (CPE) complying with the TR-069 protocol.

Alvarion's StarACS is a carrier-class ACS (Auto Configuration Server) management system designed for managing WiMAX CPEs (Customer Premises Equipment) over TR-069 protocol.

Built on an industry proven Application Server architecture, the StarACS is scalable, allowing it to support a virtually unlimited number of CPE devices.

Alvarion's StarACS standards-based solution is designed to centralize and simplify the management, provisioning, monitoring, and delivery of broadband services to CPE.

StarACS Value Proposition:

- Reduces cost of provisioning new subscribers.
- Reduces cost of provisioning new services to subscribers.
- Reduces on-going maintenance support cost.

The StarACS provides comprehensive management support for the entire CPE service life cycle, including Zero-Touch installation, provisioning, software upgrades, configuration backups, and on line support for customer support representatives.

Main features:

- Zero-touch provisioning
- Activating/Deactivating a service
- Diagnosing and configuring CPEs
- Managing and updating the firmware
- Uploading files from the CPE
- Verifying the CPE's connectivity status

- Resetting/Rebooting the CPE
- Displaying the CPE's activity log
- Monitoring CPEs

The StarACS Management application is accessed through a web browser. The web interface consists of the following sections:

- Default Profile - a default generic provisioning profile for all unknown/unmanaged CPEs
- CPE Profile - a default provisioning profile for a specific CPE model
- Update a CPE - to manage a specific CPE
- Update Group - to manage groups of CPEs
- Reports - to track and monitor CPE and system activity
- File Management - to manage firmware image and vendor configuration files
- Settings - for initial setup of the system

2. Installation

2.1 Prerequisites

Before installing the StarACS, verify that the following software is installed:

- Windows2003 Server
- Remote or Local (ACS Server) Database.
  The following databases are supported:
  - » MySQL V5.1 (latest release)
  - » Oracle 10g

NOTE

The version of Oracle running on the StarACS client must be the same version as that running on the server.

- IIS 5.0 or above
- .NET Framework 2.0
- FTP and TFTP servers - can be either a single server supplying both (e.g. 3cDaemon-http://support.3com.com/software/utilities_for_windows_32_bit.htm) or separate FTP server (e.g. FileZilla - http://filezilla-project.org) and TFTP server (e.g. pumpkin - http://kin.klever.net/pumpkin/binaries)
- HTTP File Server - is configured using the operating system IIS
- H/W capacity and requirements:

Table 1: Hardware Specifications

Description	Demo/Trail/Small Network	StarACS Small-Medium Network	Medium Network
Capacity	5,000 CPEs 5 Admin Clients	5,000 CPEs 5 Admin Clients	50,000 CPEs 5 Admin Clients
Hardware	Dual-Core Intel Xeon 5140 processor 2.33 GHz, 4 GB RAM, 120 GB HD	Quad-Core Intel Xeon x5460 processor 3.16 GHz 4 GB RAM, 160 GB HD	Single Sun Fire x4150 x4150 spec: Two Quad-Core Intel Xeon x5460 processor 3.16 GHz, 8 GB RAM, 4 x 146GB HD
Operating System	Windows 2003 R2 English	Windows 2003 R2 English	Windows 2003 R2 English
Database	MySQL 5.1 Oracle 10g	MySQL 5.1 Oracle 10g	MySQL 5.1 Oracle 10g
Installation Configuration	StarACS and Database should be installed on the same machine	StarACS and Database should be installed on the same machine	StarACS and Database should be installed on the same machine

IMPORTANT

Verify that .NET Framework 2.0 was installed after IIS was installed. If this is not the case, re-install .NET Framework 2.0.

2.1.1 Prerequisites for Oracle Installation

Before StarACS can be installed with an Oracle database, it is necessary to manually create the database, create users and import the schema.

To create Oracle database, users and import schema:

1 Manually create an empty database on the Oracle server.

2 Connect to the Database Control with SYSDBA privileges and create four users (DPS, ADMIN, CSR, ACS_USERS) with the following configuration:

a In the General tab enter the following parameters as shown in Figure 1:
Password: dps
Default Tablespace: USERS,
Temporary Tablespace: TEMP

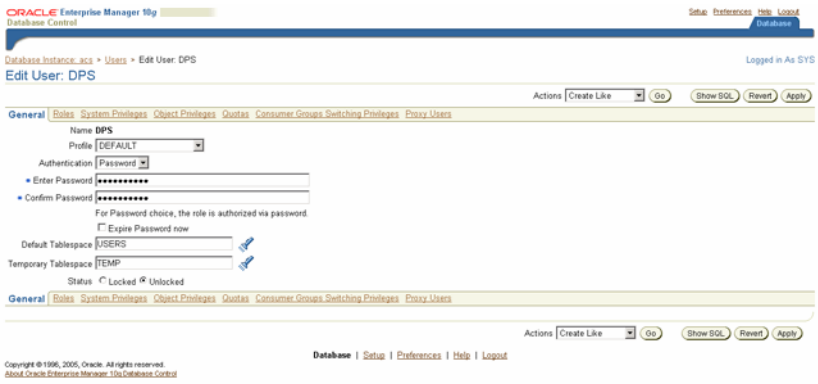

Figure 1: User Configuration - General

b In the Roles tab, check the CONNECT and DBA options (Figure 2).

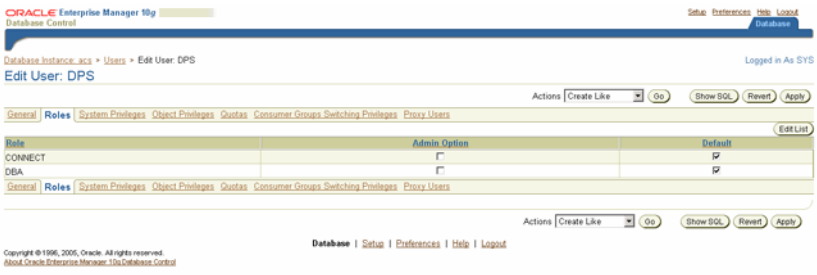

Figure 2: User Configuration - Roles

c Set the System Privilege to UNLIMITED TABLESPACE (Figure 3).

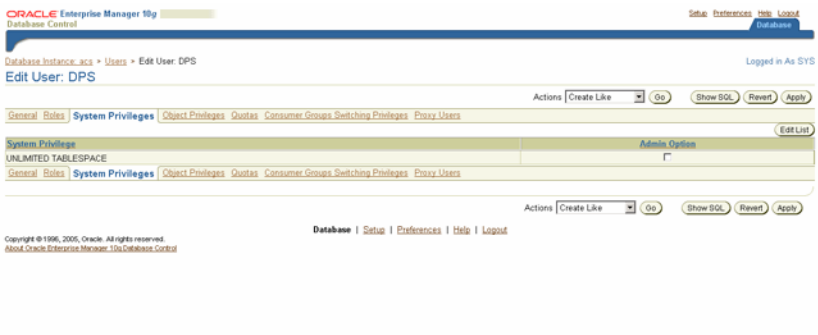
ORACLE Enterprise Manager 10g
Database Control
Edit User: DPS
General Roles System Privileges Object Privileges Quotas Consumer Groups Switching Privileges Proxy Users
System Privilege
Admin Option
UNLIMITED TABLESPACE
Actions Create Like Go Show SQL Revert Apply
Database | Setup | Preferences | Help | Logout

Figure 3: User Configuration - System Privileges

3 Copy the acs.dat file from the Setup folder in the StarACS kit to the Oracle server.

4 Open a command prompt and locate and run the imp.exe Oracle utility (see Figure 4). The default path is *C:\oracle\product\10.2.0\db_4\BIN.*

» Enter the SYSDBA username, password and the path of acs.dat file to be imported.

» Click **Enter** to accept the default values for the following questions:

```
List contents of import file only (yes/no): no >
Ignore create error due to object existence (yes/no): no >
Import grants (yes/no): yes >
Import table data (yes/no): yes >
```

» Enter **yes** and click **Enter** to change the default value for the following question:

```
Import entire export file (yes/no): no > yes
```

The Oracle schema is imported.

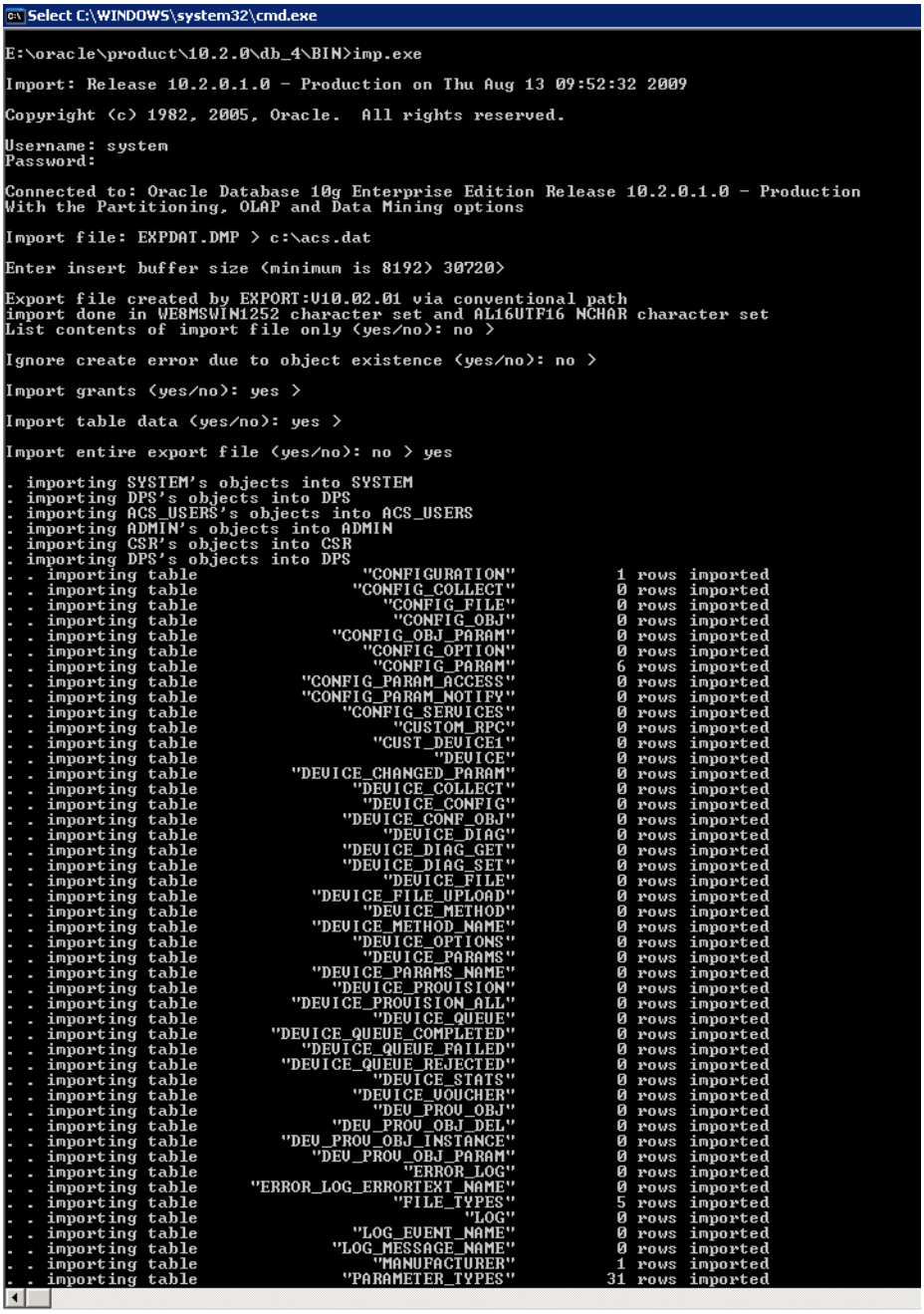
Select C:\WINDOWS\system32\cmd.exe
E:\oracle\product\10.2.0\db_4\BIN>imp.exe
Import: Release 10.2.0.1.0 - Production on Thu Aug 13 09:52:32 2009
Copyright (c) 1982, 2005, Oracle. All rights reserved.
Username: system
Password:
Connected to: Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production
With the Partitioning, OLAP and Data Mining options
Import file: EXPDAT.DMP > c:\acs.dat
Enter insert buffer size (minimum is 8192) 30720>
Export file created by EXPORT:V10.02.01 via conventional path
import done in WE8MSWIN1252 character set and AL16UTF16 NCHAR character set
List contents of import file only (yes/no): no >
Ignore create error due to object existence (yes/no): no >
Import grants (yes/no): yes >
Import table data (yes/no): yes >
Import entire export file (yes/no): no > yes
. importing SYSTEM's objects into SYSTEM
. importing DPS's objects into DPS
. importing ACS_USERS's objects into ACS_USERS
. importing ADMIN's objects into ADMIN
. importing CSR's objects into CSR
. importing DPS's objects into DPS
. . importing table "CONFIGURATION" 1 rows imported
. . importing table "CONFIG_COLLECT" 0 rows imported
. . importing table "CONFIG_FILE" 0 rows imported
. . importing table "CONFIG_OBJ" 0 rows imported
. . importing table "CONFIG_OBJ_PARAM" 0 rows imported
. . importing table "CONFIG_OPTION" 0 rows imported
. . importing table "CONFIG_PARAM" 6 rows imported
. . importing table "CONFIG_PARAM_ACCESS" 0 rows imported
. . importing table "CONFIG_PARAM_NOTIFY" 0 rows imported
. . importing table "CONFIG_SERVICES" 0 rows imported
. . importing table "CUSTOM_RPC" 0 rows imported
. . importing table "CUST_DEVICE1" 0 rows imported
. . importing table "DEVICE" 0 rows imported
. . importing table "DEVICE_CHANGED_PARAM" 0 rows imported
. . importing table "DEVICE_COLLECT" 0 rows imported
. . importing table "DEVICE_CONFIG" 0 rows imported
. . importing table "DEVICE_CONF_OBJ" 0 rows imported
. . importing table "DEVICE_DIAG" 0 rows imported
. . importing table "DEVICE_DIAG_GET" 0 rows imported
. . importing table "DEVICE_DIAG_SET" 0 rows imported
. . importing table "DEVICE_FILE" 0 rows imported
. . importing table "DEVICE_FILE_UPLOAD" 0 rows imported
. . importing table "DEVICE_METHOD" 0 rows imported
. . importing table "DEVICE_METHOD_NAME" 0 rows imported
. . importing table "DEVICE_OPTIONS" 0 rows imported
. . importing table "DEVICE_PARAMS" 0 rows imported
. . importing table "DEVICE_PARAMS_NAME" 0 rows imported
. . importing table "DEVICE_PROVISION" 0 rows imported
. . importing table "DEVICE_PROVISION_ALL" 0 rows imported
. . importing table "DEVICE_QUEUE" 0 rows imported
. . importing table "DEVICE_QUEUE_COMPLETED" 0 rows imported
. . importing table "DEVICE_QUEUE_FAILED" 0 rows imported
. . importing table "DEVICE_QUEUE_REJECTED" 0 rows imported
. . importing table "DEVICE_STATS" 0 rows imported
. . importing table "DEVICE_VOUCHER" 0 rows imported
. . importing table "DEV_PROV_OBJ" 0 rows imported
. . importing table "DEV_PROV_OBJ_DEL" 0 rows imported
. . importing table "DEV_PROV_OBJ_INSTANCE" 0 rows imported
. . importing table "DEV_PROV_OBJ_PARAM" 0 rows imported
. . importing table "ERROR_LOG" 0 rows imported
. . importing table "ERROR_LOG_ERRORTEXT_NAME" 0 rows imported
. . importing table "FILE_TYPES" 5 rows imported
. . importing table "LOG" 0 rows imported
. . importing table "LOG_EVENT_NAME" 0 rows imported
. . importing table "LOG_MESSAGE_NAME" 0 rows imported
. . importing table "MANUFACTURER" 1 rows imported
. . importing table "PARAMETER_TYPES" 31 rows imported

Figure 4: Importing the schema

2.2 Installing StarACS

It is recommended that you close any running applications on the computer. The installation should be run by a user with administrative privileges.

To install StarACS:

1 Double-click the **setup.exe** file on the installation CD. The system automatically detects whether the following applications are installed:

- JDK 1.5 – Java Development Kit
- MySQL Connector – required for connection to a MySQL database

If the applications are not installed Figure 5 is displayed.

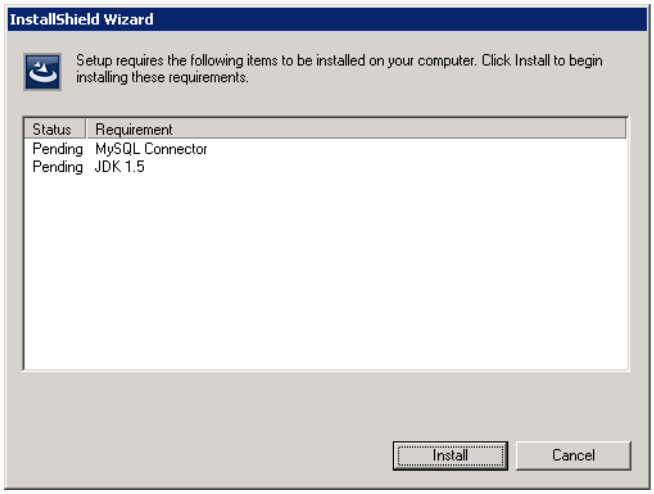

Figure 5: Additional Application Required

2 Click **Install** to begin installing the required applications. Figure 6 is displayed.

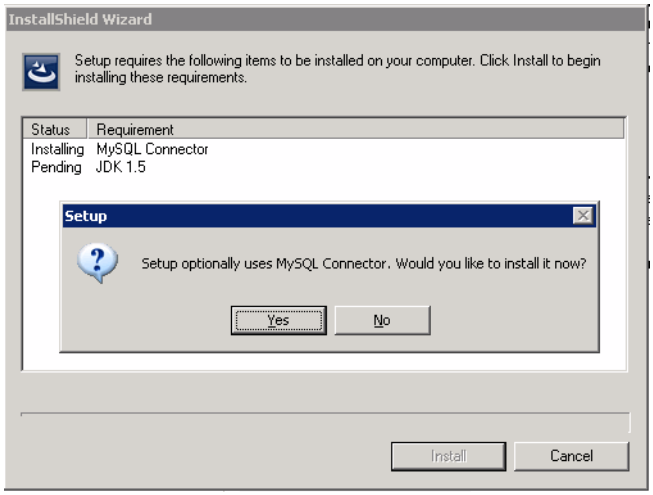

Figure 6: Installing additional applications

3 Click **Yes** if installing on a MySQL database or click **No** if installing on Oracle. Figure 7 is displayed.

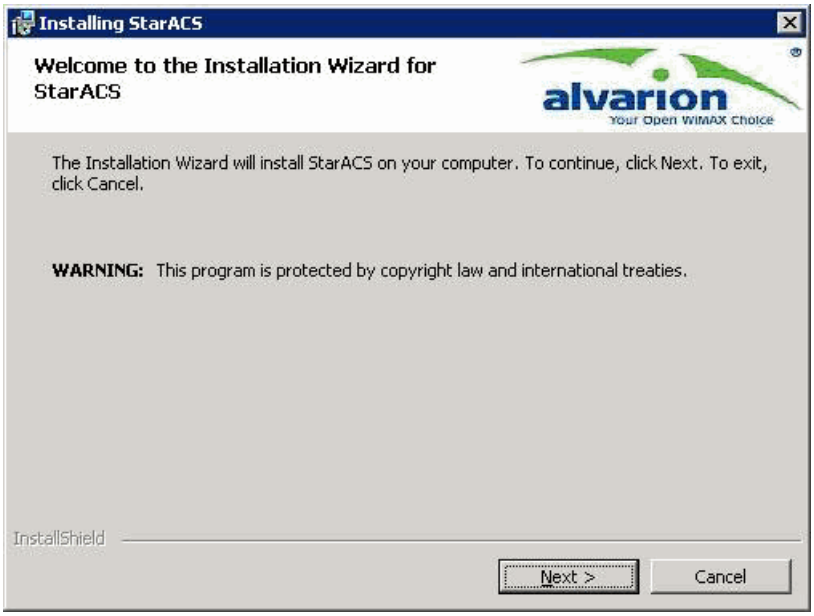
Installing StarACS
Welcome to the Installation Wizard for StarACS
alvarion
Your Open WiMAX Choice
The Installation Wizard will install StarACS on your computer. To continue, click Next. To exit, click Cancel.
WARNING: This program is protected by copyright law and international treaties.
InstallShield
Next >
Cancel

Figure 7: Installation Wizard

4 Click **Next**. The *License Agreement Window* is displayed.

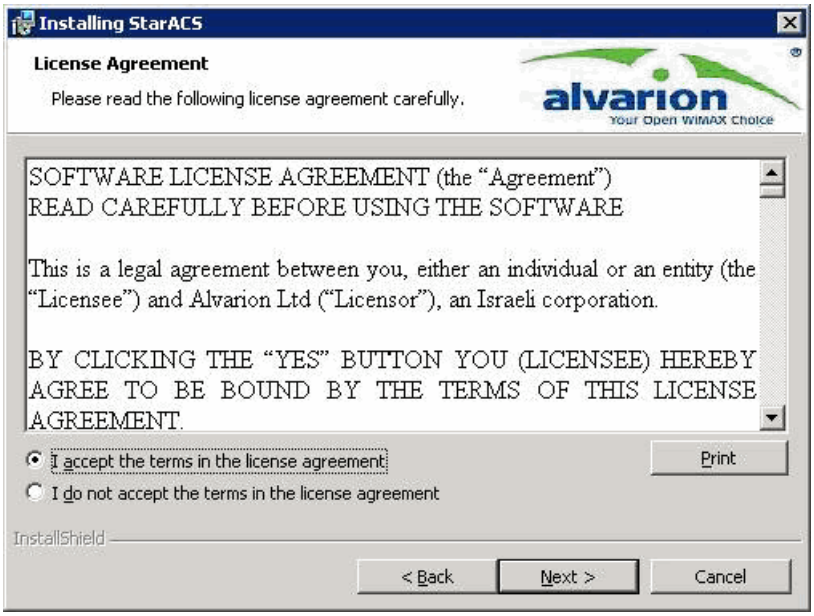
Installing StarACS
License Agreement
Please read the following license agreement carefully.
alvarion
Your Open WiMAX Choice
SOFTWARE LICENSE AGREEMENT (the "Agreement")
READ CAREFULLY BEFORE USING THE SOFTWARE
This is a legal agreement between you, either an individual or an entity (the "Licensee") and Alvarion Ltd ("Licensor"), an Israeli corporation.
BY CLICKING THE "YES" BUTTON YOU (LICENSEE) HEREBY AGREE TO BE BOUND BY THE TERMS OF THIS LICENSE AGREEMENT.
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

Figure 8: License Agreement Window

5 Accept the terms of the License Agreement and click **Next**. T*he Destination Folder Window* is displayed. .

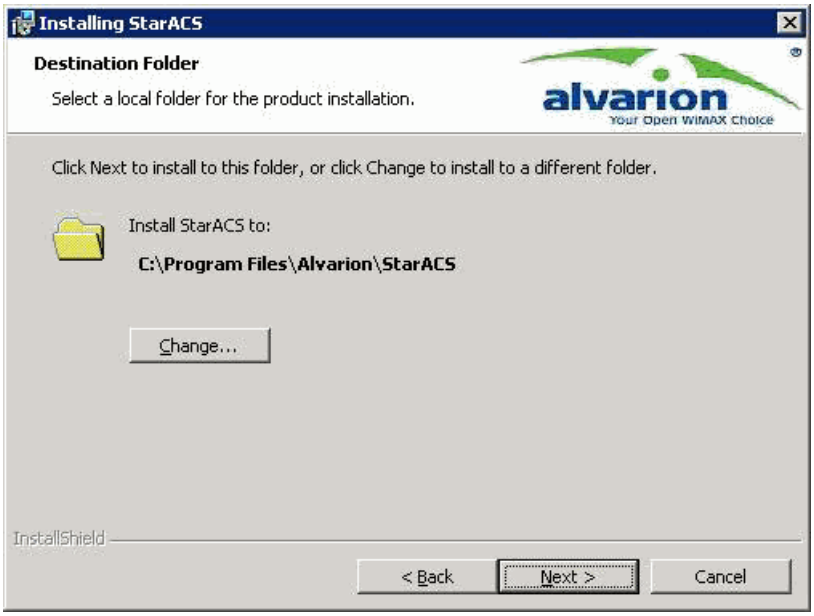

Figure 9: Destination Folder Window

6 Click **Next** to accept the default folder or click **Change** to select another folder. The *Database Configuration Window* is displayed.

7 Select the type of Database Server:

a If MySQL is selected (Figure 10), enter the Database Connection options: Server URL, Server Port, User Name, and Password. Click **Next**.

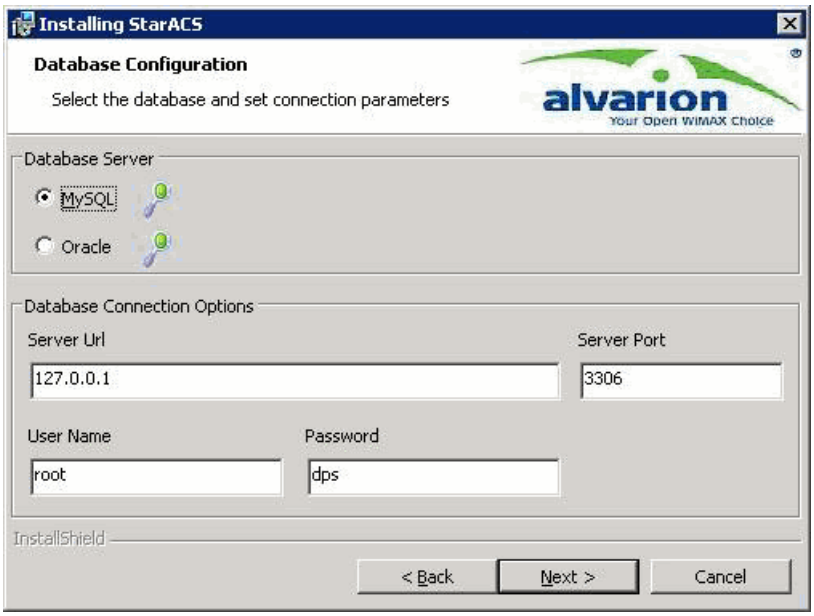

Figure 10: Database Configuration Window- MySQL

b If Oracle is selected (Figure 11), enter the Database Connection options: Server URL, Server Port, User Name, Password and Service Name. Click **Next**.

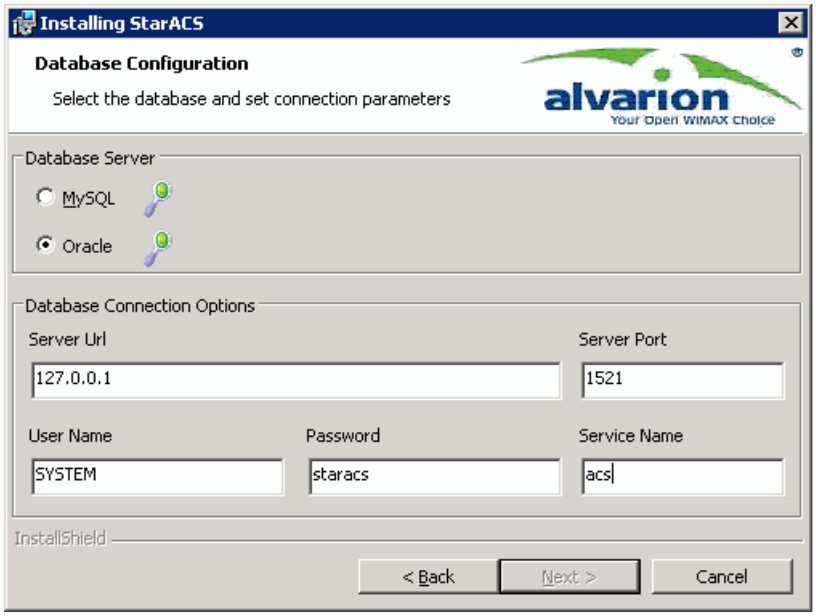

Figure 11: Database Configuration Window- Oracle

Figure 12 is displayed.

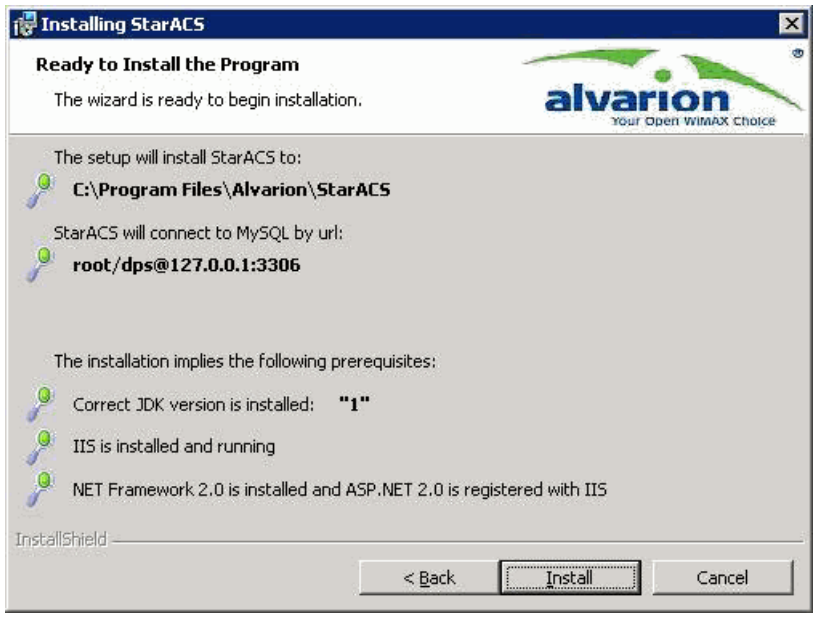
Installing StarACS
Ready to Install the Program
The wizard is ready to begin installation.
alvarion
Your Open WiMAX Choice
The setup will install StarACS to:
C:\Program Files\Alvarion\StarACS
StarACS will connect to MySQL by url:
root/dps@127.0.0.1:3306
The installation implies the following prerequisites:
Correct JDK version is installed: "1"
IIS is installed and running
NET Framework 2.0 is installed and ASP.NET 2.0 is registered with IIS
InstallShield
< Back
Install
Cancel

Figure 12: Ready to Install

8 Verify the following information on the screen:

- Destination Folder location
- Database Connection parameters
- JDK 1.5 is installed and pointing to the correct path
- IIS is installed and running
- .NET Framework 2.0 is installed and registered to IIS

To proceed with the installation, click **Install**. To change settings or make corrections, click **Back**.

NOTE

When installing with Oracle database, the StarACS connection to the Oracle server might fail. As the database configuration is manual, this is not significant and you can proceed with the installation even if an error message appears.

The *Installing StarACS Window* is displayed.

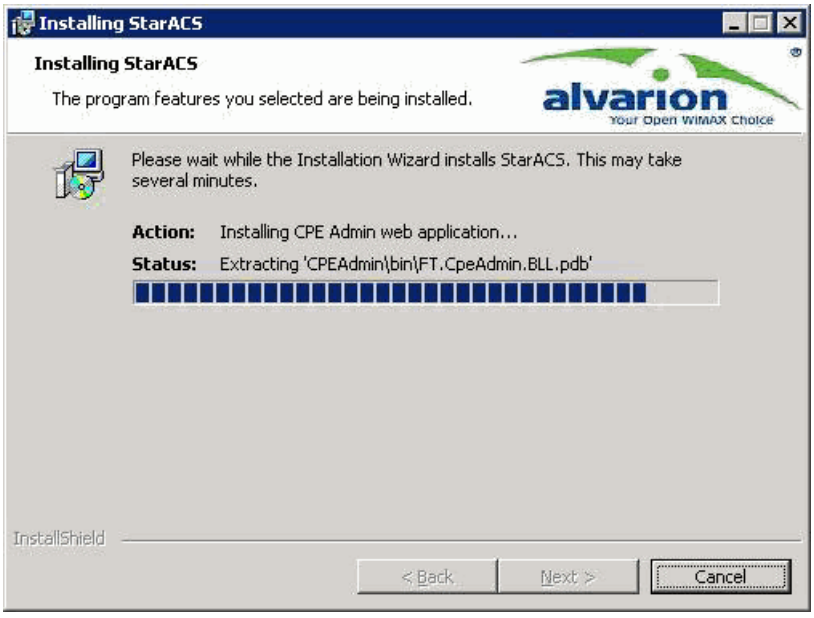
Installing StarACS
Installing StarACS
The program features you selected are being installed.
alvarion
Your Open WiMAX Choice
Please wait while the Installation Wizard installs StarACS. This may take several minutes.
Action: Installing CPE Admin web application...
Status: Extracting 'CPEAdmin\bin\FT.CpeAdmin.BLL.pdb'
InstallShield
< Back
Next >
Cancel

Figure 13: Installing StarACS Window

9 The installation process takes several minutes. Once StarACS has been successfully installed Figure 14 is displayed.

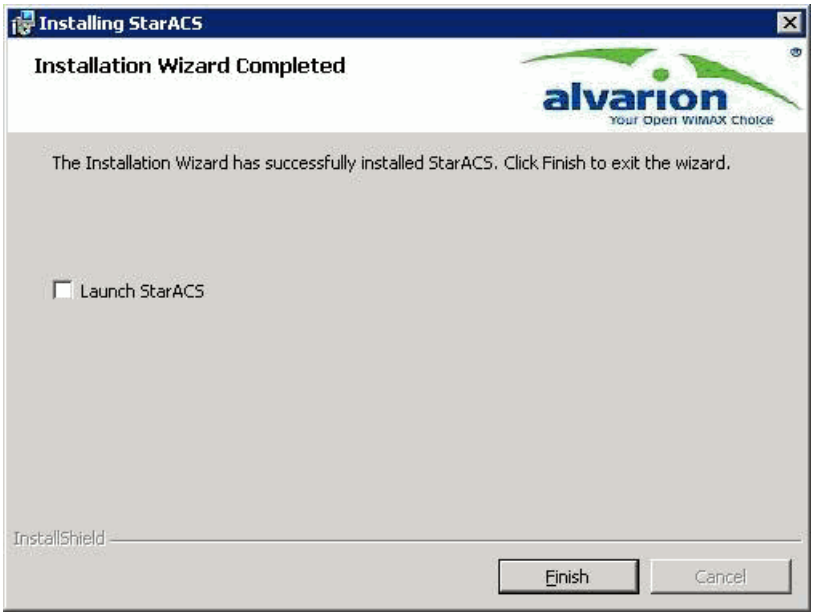

Figure 14: Installation Wizard Completed

10 Uncheck the Launch StarACS checkbox and click **Finish.** (For installations on MySQL servers it is not necessary to uncheck the Launch StarACS checkbox.)

11 For installations on Oracle servers **ONLY**, configure the connection to the database:

a In the folder *C:\Program Files\Alvarion\StarACS\ACS\server\dps\deploy* delete the file mysql-ds.xml and open the file oracle-ds.xml. Change the IP, the Port and the SID to the correct values for the Oracle server. These parameters appear in three different places in the file, enclosed by the <connection-url> tags.

b In the folder *C:\Inetpub\wwwroot\StarACS\XML* open the file ConnectionStrings.xml. Change the database type to Oracle(<DBType>Oracle</DBType>) and change the values for the IP, Port and SID inside the tags <Oracle>).

12 Start the StarACS server from the desktop icon or from *Start* > *Programs* > *Alvarion.*

3. Getting Started

3.1 Login

To log in to the StarACS application for the first time, the user must have administrator permission. The default user name is admin, and the default password is admin. This default cannot be changed during the installation.

To start StarACS:

1 In the web browser, enter the link to the StarACS home page (http://<ACS ip address>/StarACS/Default.aspx) and press Enter. The login window is displayed.

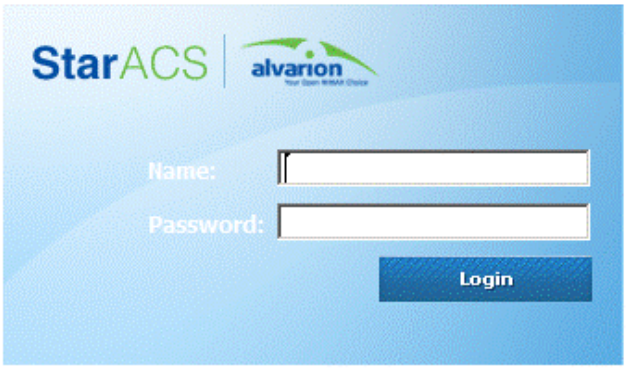

Figure 15: Login Window

2 Enter the administrator user name and password (default name and password: admin/admin) and press Enter or click Login. The StarACS Update a CPE page is displayed.

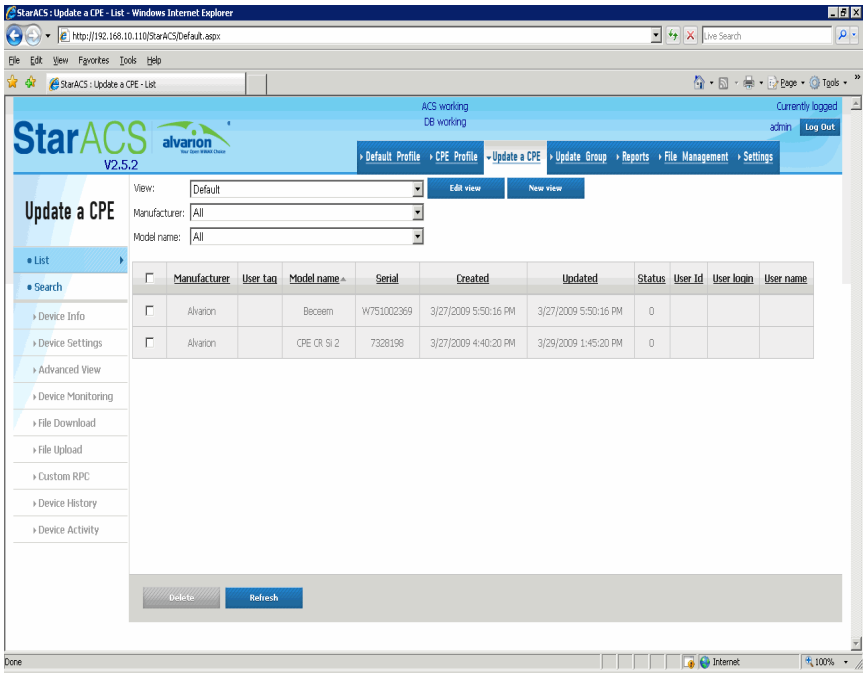

Figure 16: STAR ACS Main Window

3.2 The Main Window

The StarACS user interface consists of four main areas:

- Main tabs: Select the preferred administration functionality
- Menu per tab: An options menu per each tab
- Main screen area: The main data area
- Buttons per screen: Action buttons per each screen

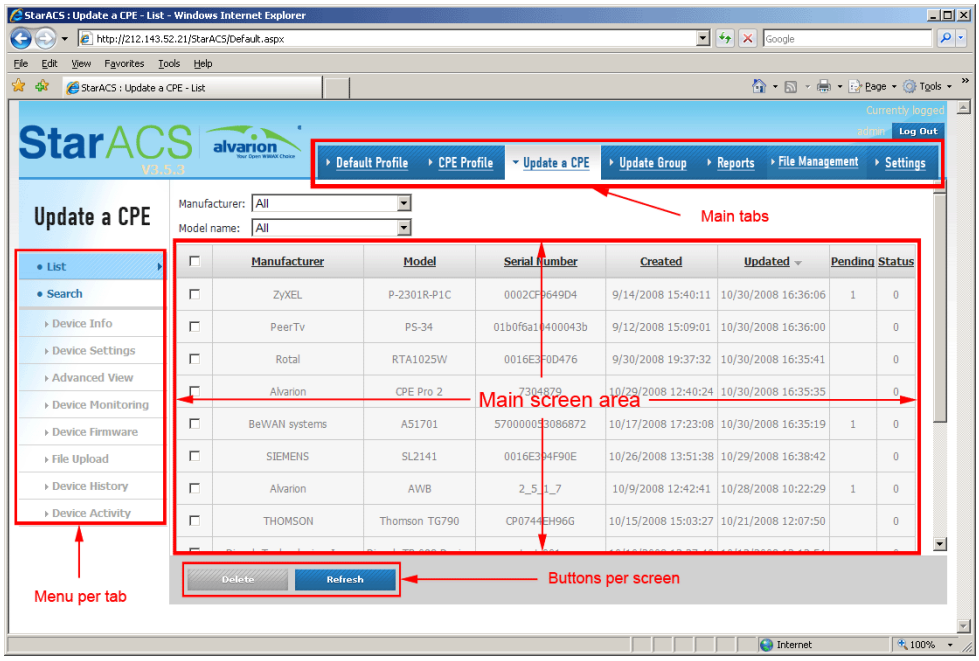

Figure 17: Main Window

4. Defining StarACS Settings

Before you can use the StarACS for managing CPEs, you need to define initial settings, such as server details, allowed users, etc.

The following sections describe the Settings tab and its menu options:

- "Defining ACS and DB Settings" on page 16
- "E-mail Server Settings" on page 18
- "Alerts Settings" on page 19
- "User Management Settings" on page 21
- "ACS (CPE) Users Settings" on page 23
- "File Server Settings" on page 26

4.1 Defining ACS and DB Settings

The ACS and DB menu option enables setting system parameters for the ACS and database servers.

To define ACS and DB settings:

1 Click the ACS and DB menu option.

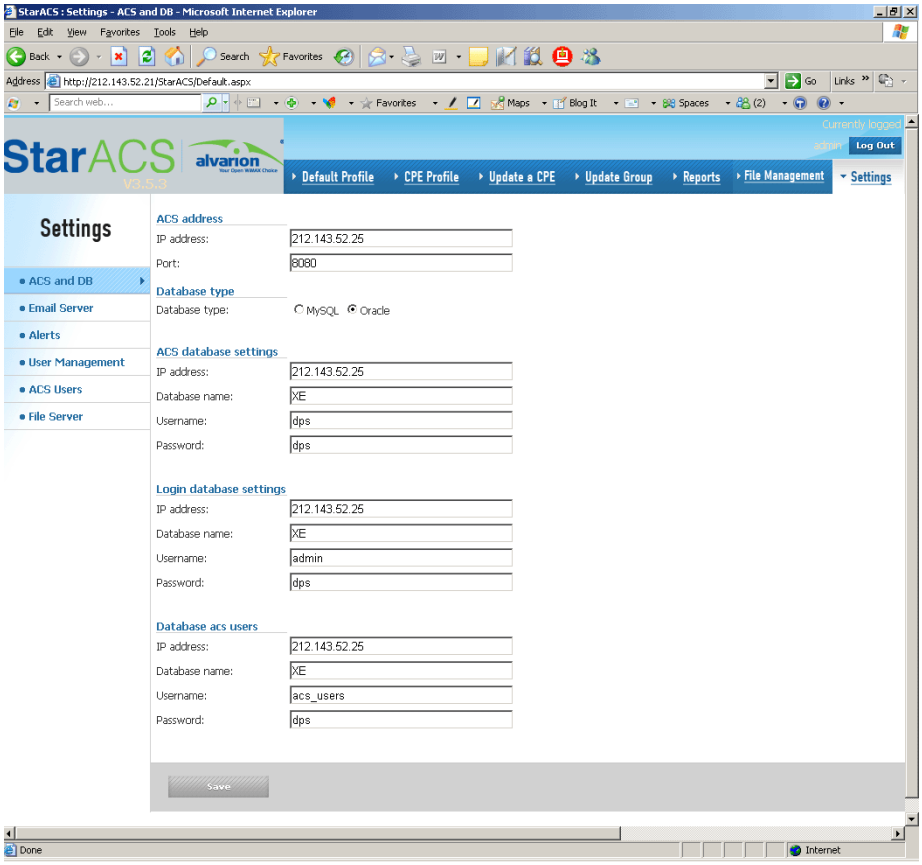

Figure 18: ACS and DB Window

2 Modify the following parameters as required:

Table 2: ACS and DB Settings

Parameter	Description
ACS address:	
IP address	ACS IP address
Port	ACS port number
Database type:	
Database type	The database type. The possible values are MySQL or Oracle.

Table 2: ACS and DB Settings

Parameter	Description
ACS database settings:	
IP address	ACS database server's IP address
Database name	ACS database name
Username	ACS database username
Password	ACS database password
Login database settings:	
IP address	Login database server IP address
Database name	Login database name
Username	Login database username
Password	Login database password
Database acs users:	
IP address	ACS users database server's IP address
Database name	ACS users database name
Username	ACS users database username
Password	ACS users database password

3 Click Save to save your settings.

4.2 E-mail Server Settings

You can define an address for sending alerts to inform the operator about system events.

To define E-mail server settings:

1 Click the Email Server menu option to enable setting system parameters for the email server.

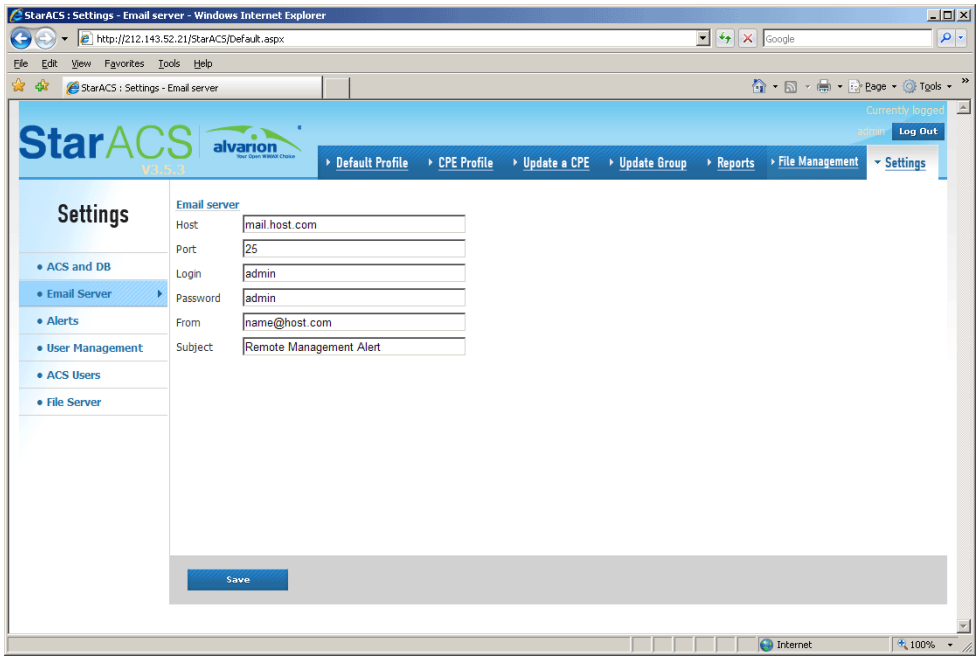

Figure 19: E-mail Server Window

2 Set the following fields as required:

Table 3: E-mail Server Settings

Parameter	Description
Host	email server host name
Port	email server port number
Login	email server username
Password	email server password
From	email address used to send alerts
Subject	text used as the subject line in email alerts

3 Click Save to save your settings.

4.3 Alerts Settings

Alerts can be configured to be triggered by loss of connectivity of the ACS or database servers.

To define Alerts settings:

1 Click the Alerts menu option to enable configuring alerts.

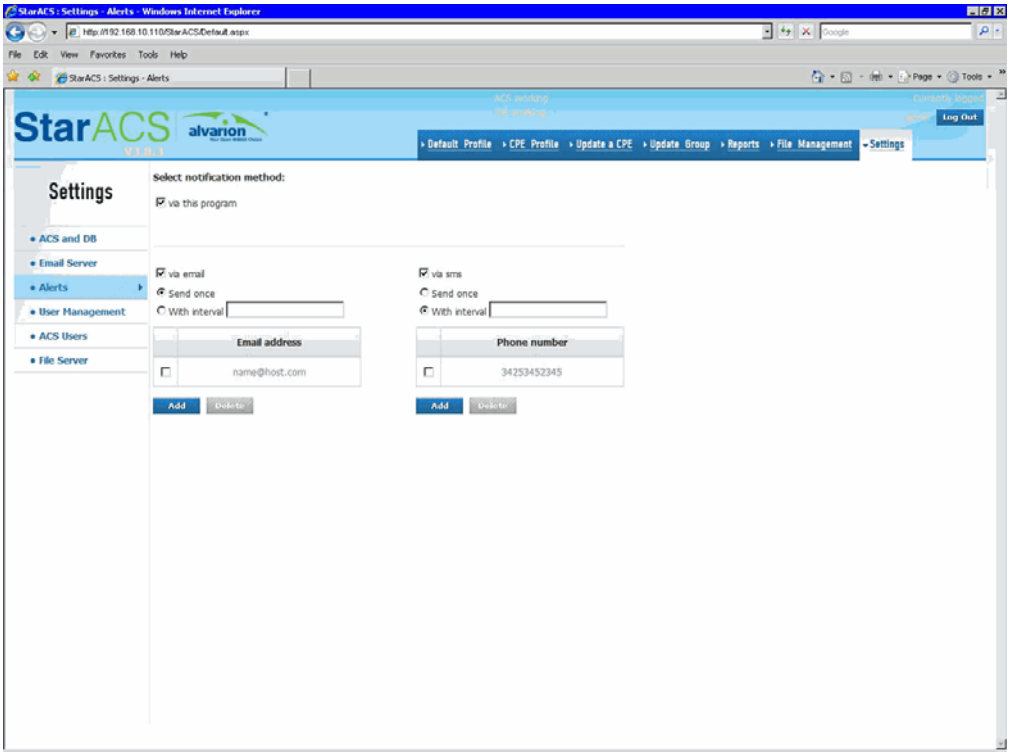

Figure 20: Alerts Window

2 Select the notification method. The possible options are: via this program, via email, or via sms. You can select more than one option, or all.

» If you select via e-mail or via sms, choose whether to send once, or to send periodically. To send periodically, enter the periodic interval in seconds.

» If you select via e-mail, select the e-mail address to receive the alert message.

» If you select via sms, select the telephone number to receive the alert message.

3 If you select via email or via sms, click the corresponding Add button. The save window appears.

4 Enter a valid email address or phone number and click Save to add users to the list. Alert notification will be sent to all email addresses and phone numbers in the list.

4.4 User Management Settings

This page allows managing the end users of StarACS.

Click the User Management menu option to display a table of users.

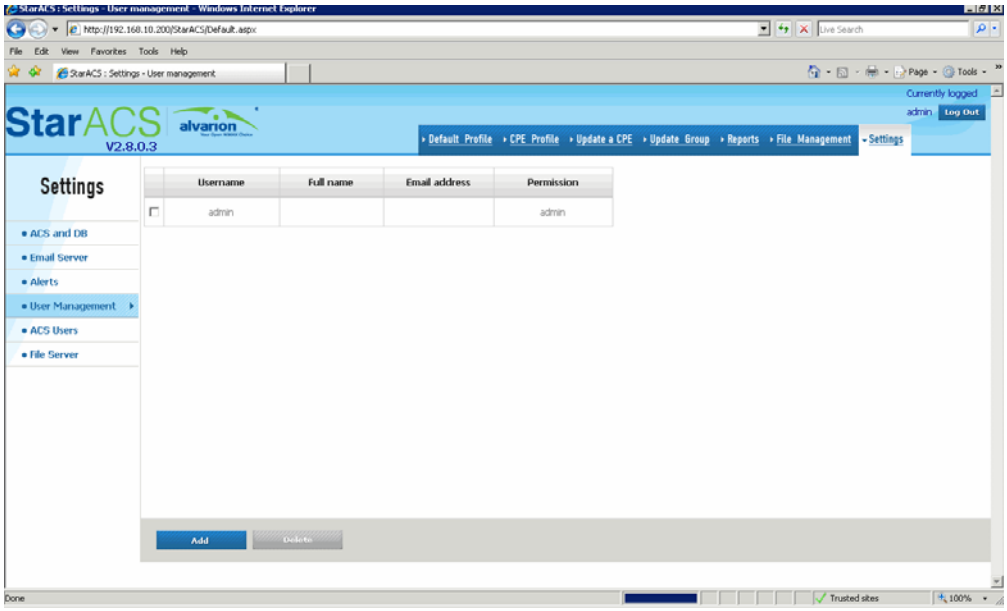

Figure 21: User Management Window

The table displays the following fields:

- Username
- Full name
- E-mail address
- Permission

The following controls are available:

- Add - creates a new user
- Delete - removes a user

To create a new user:

1 Click Add. The following page is displayed:

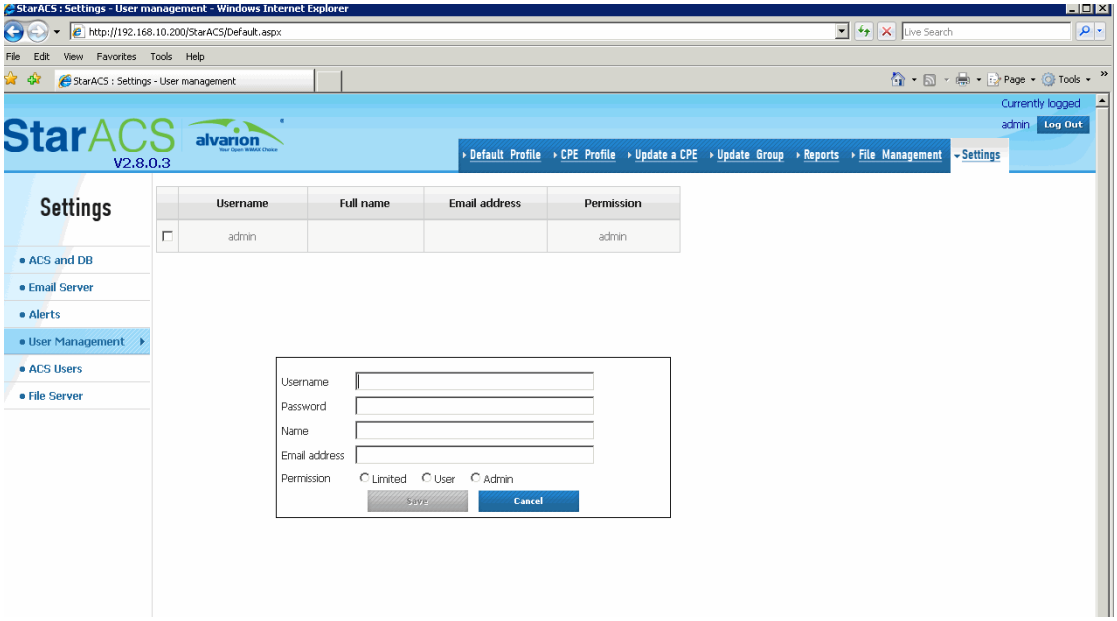

Figure 22: Adding New User

2 Enter the Username and Password for the new user.

3 Enter the user's Name and Email address.

4 Check a permission level for the user. Users with Limited permission, have Read Only rights, users with User permission have Read/Write access on a single device and users with Admin permission have full rights.

5 Click Save. The new user is added to the user table.

To edit a user:

1 Click on the table row of the user entry to be edited. The following page is displayed:

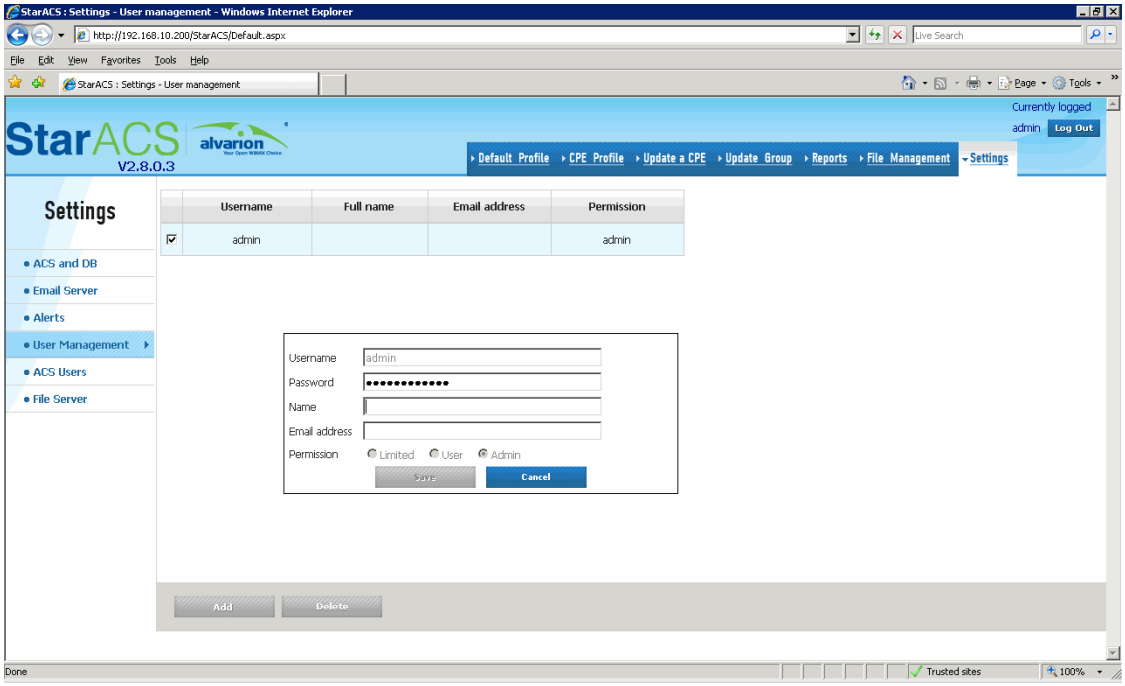

Figure 23: Editing User

2 Modify the desired fields.

3 Click Save. The user entry is modified in the user table.

To delete a user:

1 Check the box in the table row of the user entry to be edited.

2 Click Delete. A confirmation window appears.

3 Click OK. The user is deleted.

4.5 ACS (CPE) Users Settings

ACS Users is a white list of entries used to identify CPEs connected to ACS. Each CPE is assigned a “user” name and password that the management system identifies and matches to the database. Only upon identification the communication with the specific CPE is allowed. It is only necessary to define ACS Users if an authentication method is required between the CPE and ACS.

Click the ACS Users menu option to enable adding or deleting ACS users.

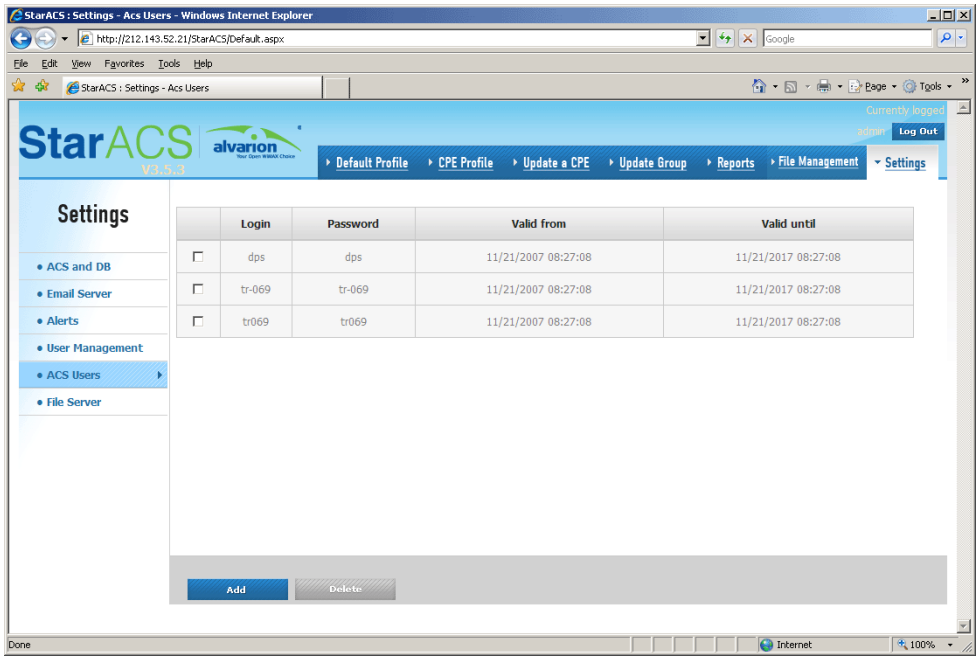

Figure 24: ACS Users

The following fields are displayed in the ACS user table:

- Login - ACS user name
- Password - ACS user password
- Valid from - ACS user start effective date and time
- Valid until - ACS user end effective date and time

To create a new ACS user:

1 Click Add. The following page is displayed:

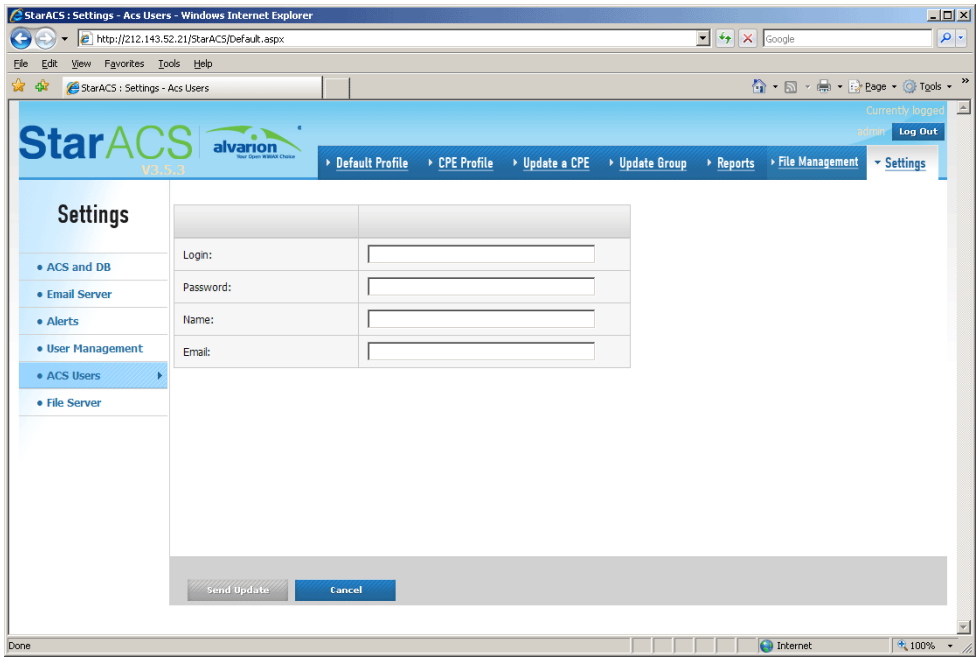

Figure 25: New ACS User

2 Enter the Login and Password for the new user.

3 Enter the user's Name and Email.

4 Click Send Update. The new ACS user is added to the ACS user table.

To edit an ACS user:

1 Click on the table row of the user entry to be edited.

2 Modify the desired fields.

3 Click Send Update. The user entry is modified in the user table.

To delete an ACS user:

1 Check the box in the table row of the ACS user entry to be edited.

2 Click Delete. A confirmation window appears.

3 Click OK. The ACS user is deleted.

4.6 File Server Settings

You can define the file server, CPE download server, and CPE upload file server. These settings are device dependent. For more information for a specific device refer to Section 13.

To define server settings

1 Click the File Server menu option to enable server configuration.

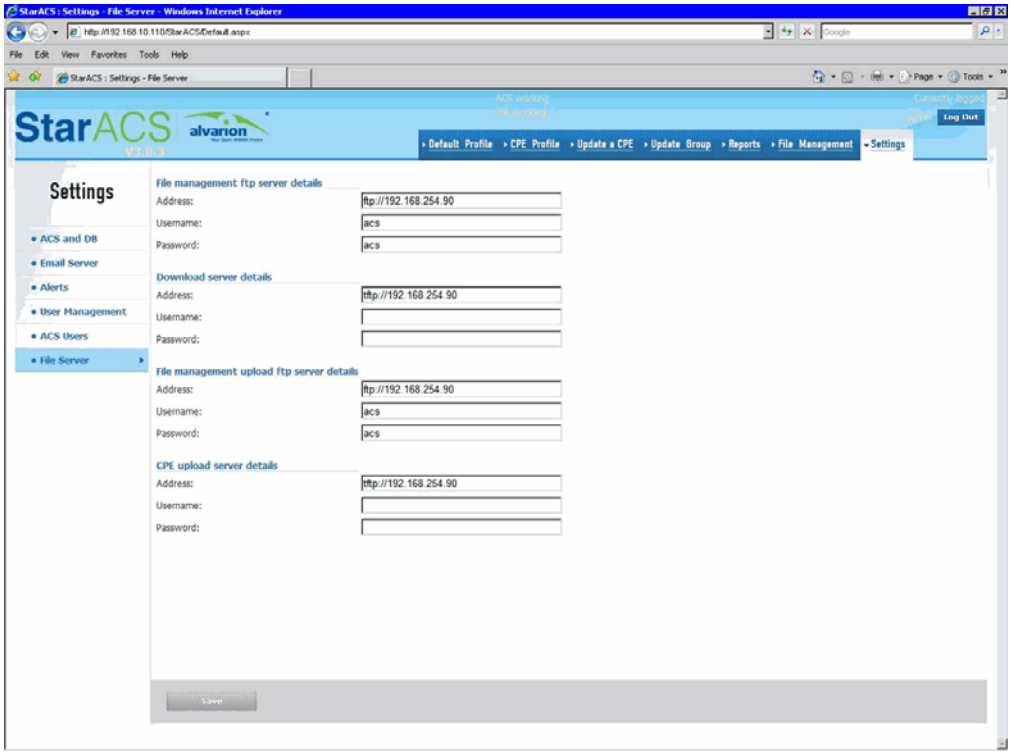

Figure 26: File Server Window

2 Set the address, username and password of the following:

» File management ftp server - URL address of the file server used for download (FTP).
Example:
ftp://<ftp server machine IP>

user: ftp ACS user
password: ftp ACS user password

» Download server - URL address from where the CPE downloads files when using the default **from list** file download option.
Note: The settings change according to the main CPE type in use.

» File management upload ftp server - URL address of the file server used for upload (FTP)
Example:
ftp://<ftp server machine IP>
user: ftp ACS user
password: ftp ACS user password

» CPE upload server - URL address to where the CPE uploads files when using the default **from list** file upload option.
Note: The settings change according to the main CPE type in use.

3 Click Save to save your settings.

5. Defining a CPE Default Profile

The default profile is intended for unknown or unmanaged CPEs, and contains a few basic management parameters to facilitate the connection between the ACS and CPE. Unknown CPEs can be fully managed except for having a common CPE configuration file (see “Defining a CPE Profile” on page 32).

There can be several Default profiles; however, only one can be active at any given time. The active default profile parameters are assigned to a newly connected CPE.

Click the Default Profile tab to display the Default Profile page. The Default Profile menu enables the following options:

■ “Viewing Available Default Profiles” on page 27

■ “Importing Default Profiles” on page 30

■ “Creating a New Default Profile” on page 31

5.1 Viewing Available Default Profiles

Click the View menu option to display a table of default profiles:

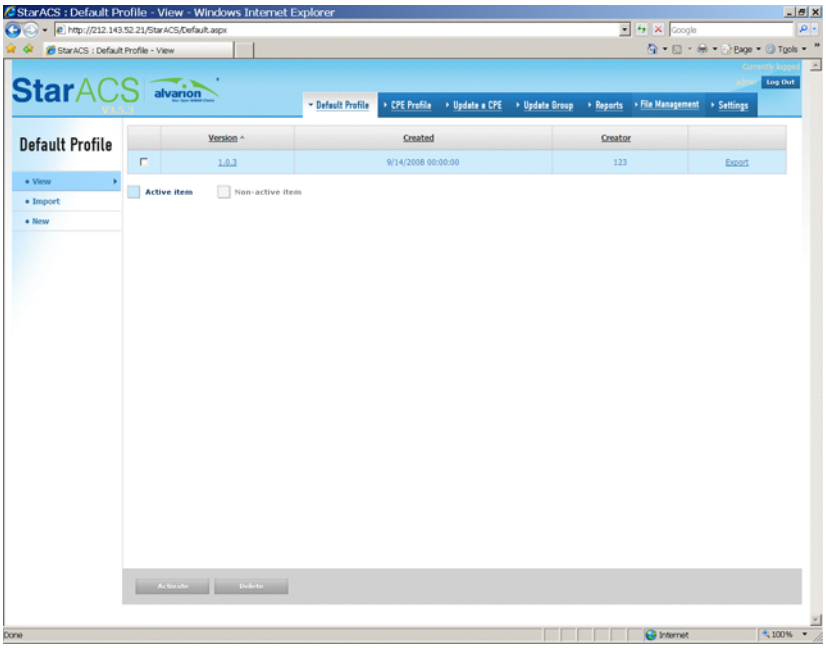

Figure 27: Default Profile Window

The table displays the following fields:

- Version - default profile version number
- Created - default profile creation date and time
- Creator - username who created the default profile

The following actions are available:

- Sort - sorts the table by the selected field
- Edit - edits the selected profile
- Export - exports the selected profile to an external xml file that can be later on used to apply on a CPE profile.
- Activate - activates the selected profile. An unknown/unmanaged CPEs will receive the active default profile parameters when first connecting to the ACS.
- Delete - deletes the selected profile

To sort the default profile table by a field:

Click the selected field name in the profile table header row. The profile table is sorted by the selected parameter in ascending order (▲). To sort in descending order (▼), click the selected parameter name again.

To export a profile:

Click Export for the selected profile entry in the table. A dialog box opens asking if you want to open or save the profile file.

To activate a profile:

1 Check the box in the row for the selected profile entry in the table.

2 Click Activate. The profile is activated and the table row is color-coded blue.

NOTE

After a profile is activated, the profile that was active previously, is deactivated and the table row is color-coded gray.

To delete a profile:

1 Check the box in the row for the selected profile entry in the table.

2 Click Delete. The profile is deleted.

NOTE

Only deactivated profiles can be deleted.

To edit a profile:

1 Click any field in the row of the selected entry in the table. A profile parameter table is displayed.

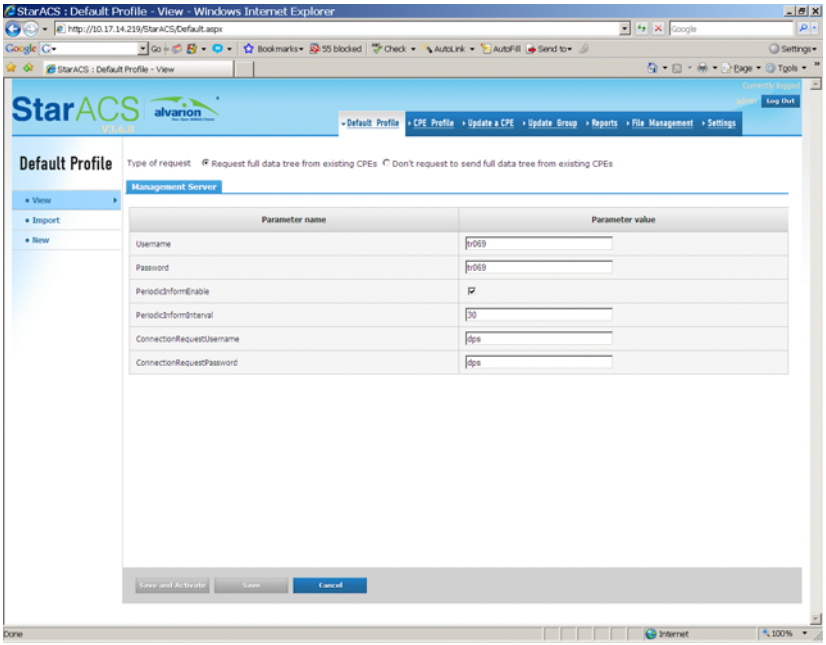

Table 4: Example of Default Profile Parameters Table

2 Select whether or not to send a request for the full data tree from existing CPEs.

3 Edit the parameter values (refer to Table 9)

4 To save the profile without activating it, click Save. To save the profile and activate it, click Save and Activate. The profile is saved. If activated, the table row is color-coded blue.

5.2 Importing Default Profiles

You can import existing xml profile files to your list of profiles. Then you can activate a profile as the currently used default profile for new CPEs.

To import a profile:

1 Click the Import menu option. The following page is displayed:

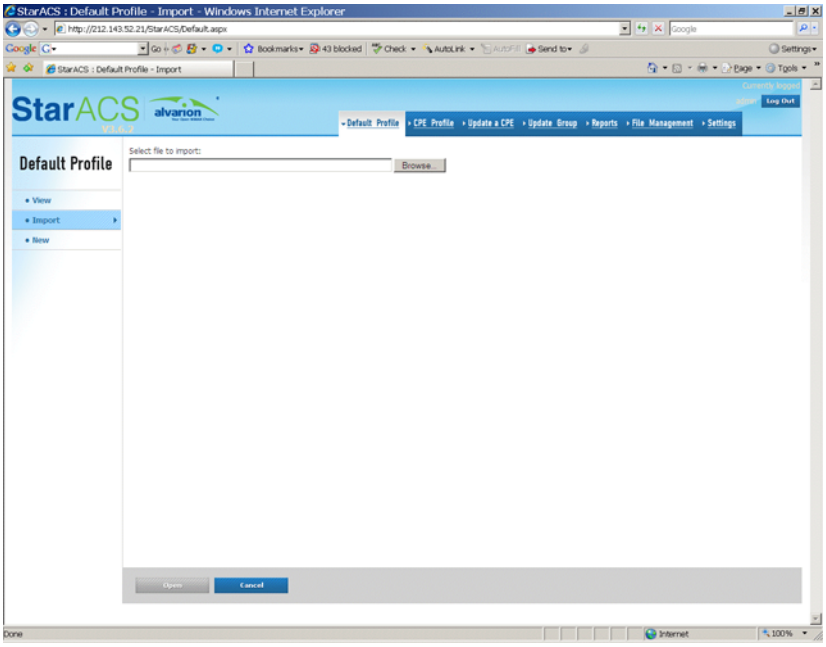

Figure 28: Import File Window

2 Enter the file name or click Browse to select the file to import.

3 Click Open. The imported profile is displayed in the profiles list.

5.3 Creating a New Default Profile

You can create a new profile to be used as your default for unknown/unmanaged CPEs.

To create a new default profile:

1 Click the New menu option to create a new profile. The following page is displayed:

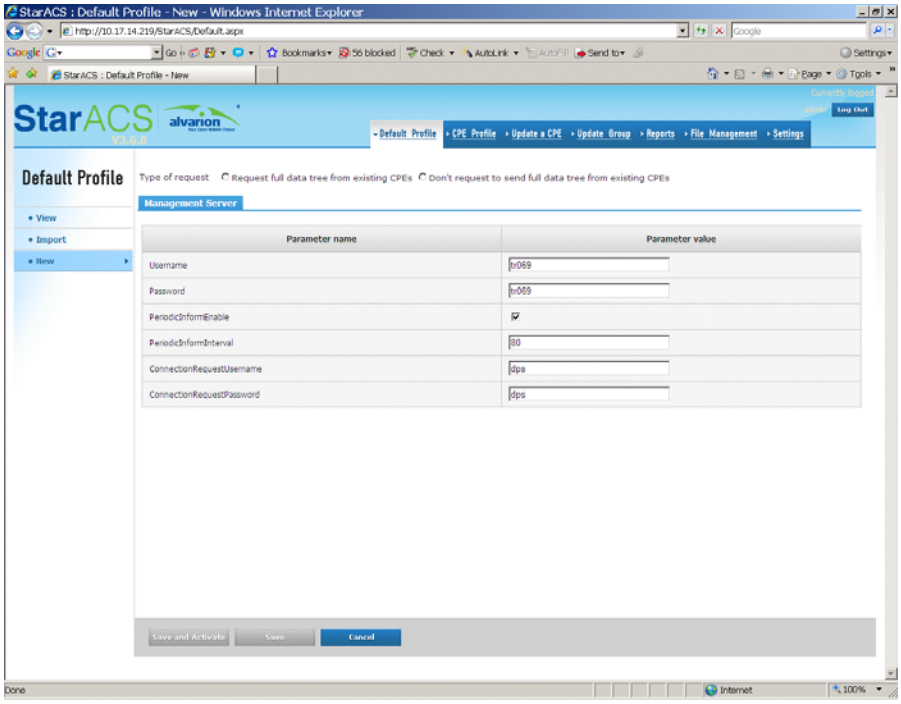

Figure 29: Create a New Default Profile

2 Follow the procedure described in "To edit a profile:" on page 30, from step 2.

5.4 Fast Provisioning of a New CPE

When a CPE is logged into the ACS system for the first time, the values of the profile are registered into the CPE.

If there is no profile model for the specific CPE model or manufacturer, the default profile values are applied to the newly introduced CPE.

6. Defining a CPE Profile

The CPE profile serves for default provisioning of a specific CPE type. It includes parameters that are more specific than the ones defined in the Default Profile (see Table 9- "Default Profile Parameters - PRO CPE and Si CPE" on page 97). Each CPE model can have more than one profile, however only one is active at any given time. When deleting an active CPE Profile, you must manually reactivate another profile if it exists, otherwise the Default Profile will apply for this product class.

Click the CPE Profile tab to display the CPE Profile page. The CPE Profile menu has the following options:

- "Viewing and Managing CPE Profiles" on page 33

- "Importing CPE Profiles" on page 36
- "Creating a New CPE Profile" on page 37

6.1 Viewing and Managing CPE Profiles

In general, the CPE sends its whole data model to the StarACS during the first connection; on subsequent Inform connections, the CPE sends only a select group of management parameters.

Click the View menu option to display a table of CPE profiles:

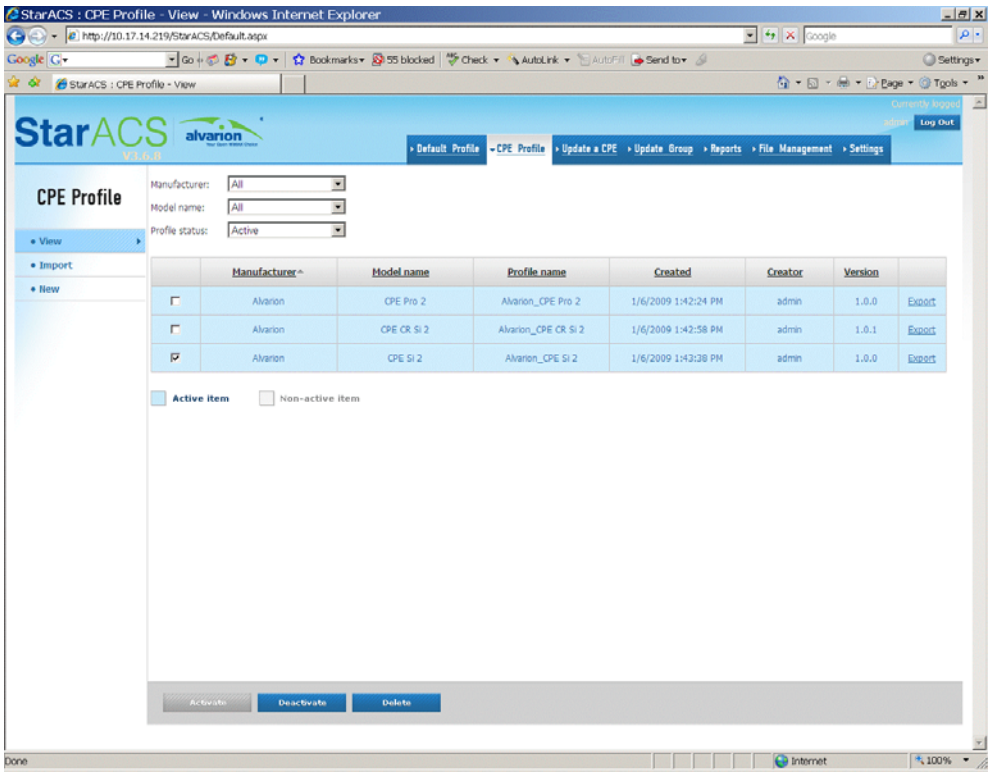

Figure 30: CPE Profiles Window

The table may be filtered by:

- Manufacturer
- Model name
- Profile status - (Active or Not Active)

The table displays the following fields:

- Manufacturer - CPE manufacturer
- Model name - CPE model name
- Profile name - CPE profile name
- Created - CPE profile creation date and time
- Creator - username who created the CPE profile
- Version - CPE profile version number

The following actions are available:

- Sort - sorts the table by the selected field
- Edit - edits the selected profile
- Export - exports the selected profile
- Activate - activates the selected profile
- Deactivate - deactivates the selected profile
- Delete - deletes the selected profile

NOTE

Only a CPE profile for which a template exists can be edited. A template should also exist when creating a new profile.

To sort the profile table by a field:

Click the selected field name in the profile table header row. The profile table is sorted by the selected field in ascending order (▲). To sort in descending order (▼), click the selected field name again.

To export a profile:

Click Export for the selected profile entry in the table. A dialog box opens asking if you want to open or save the profile file.

To activate a profile:

1. Check the box in the row for the selected profile entry in the table.
2. Click Activate. The profile is activated and the table row is color-coded blue.

To edit a profile:

1. Make sure a template exists for the CPE you want to create a new profile. If not, create a template as follows:
   a. Click Update a CPE and select a CPE from which to create a template
   b. Click the Device Info menu option; the information about the device is displayed.
   c. Click the Create Template button; a template is created.
   d. Click CPE Profile to return to the CPE Profile page.
2. Click any field in the row of the selected entry in the table. The profile parameter table is displayed.

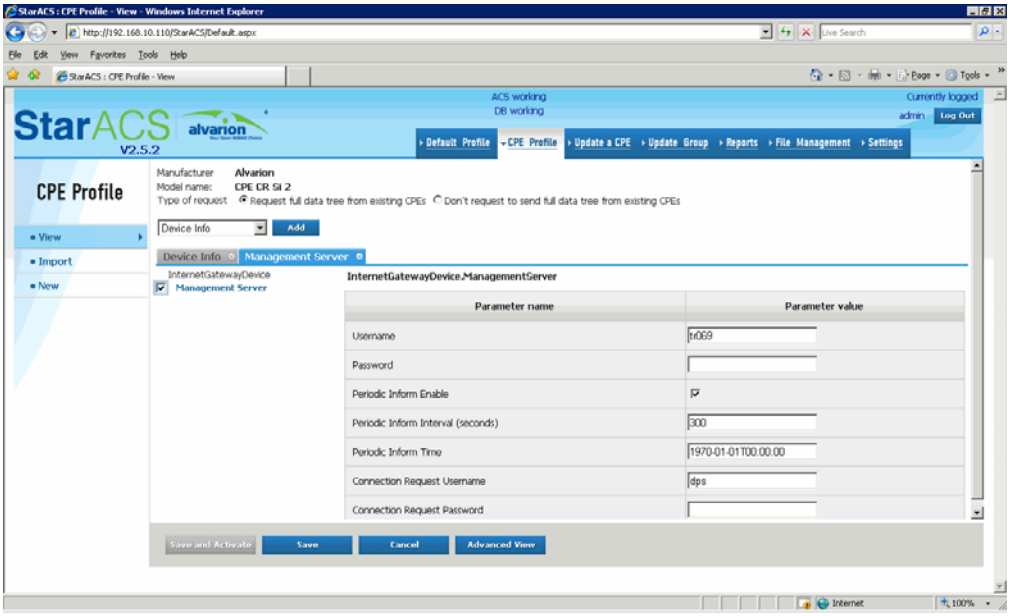

Figure 31: Editing CPE Profile

3 Select whether or not to send a request for the full data tree from existing CPEs.

4 Click the parameter group tab (e.g. Management Server).

5 Edit the parameter values (Refer to "Device Dependent Parameters and File Transfer Configurations" on page 99).

6 To edit an additional group, select the group from the list and click Add.

7 To view the entire parameter tree, click Advanced View.

8 To save the profile without activating it, click Save. To save the profile and activate it, click Save and Activate. The profile is saved. If activated, the table row is color-coded blue. Activating automatically deactivates any previous active profile for a specific CPE model (if exists).

9 You can deactivate the profile by using the buttons located at the bottom.

6.2 Importing CPE Profiles

Importing a profile is useful for rapidly performing backup-restore or pre-configuring CPE profiles instead of creating them manually.

To import a CPE profile:

1 Click the Import menu option to import a profile. The following page is displayed:

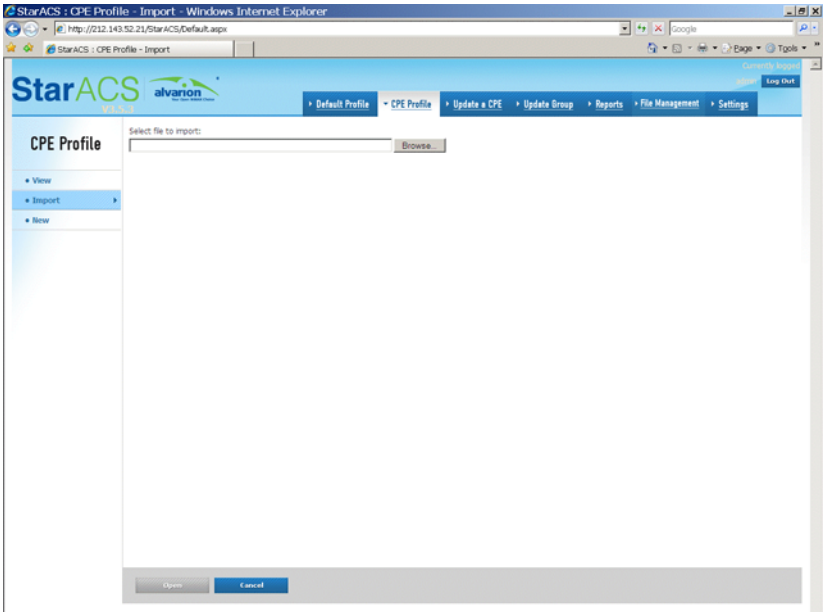

Figure 32: Import Profile Window

2 Enter the file name or click Browse to select the file to import.

3 Click Open. The imported profile is displayed.

6.3 Creating a New CPE Profile

Creating a CPE profile means that all CPEs of the same manufacturer and model will receive this profile as part of the initial connection. A CPE profile is translated into a device configuration profile with TR objects and parameters.

A new CPE profile can be created only if a profile template exists.

To create a new CPE profile:

1 Make sure a template exists for the CPE you want to create a new profile. If not, create a template as follows:

a Click Update a CPE and select a CPE from which to create a template.

b Click the Device Info menu option; the information about the device is displayed.

c Click the Create Template button; a template is created.

d Click CPE Profile to return to the CPE Profile page.

2 Click the New menu option. The following page is displayed:

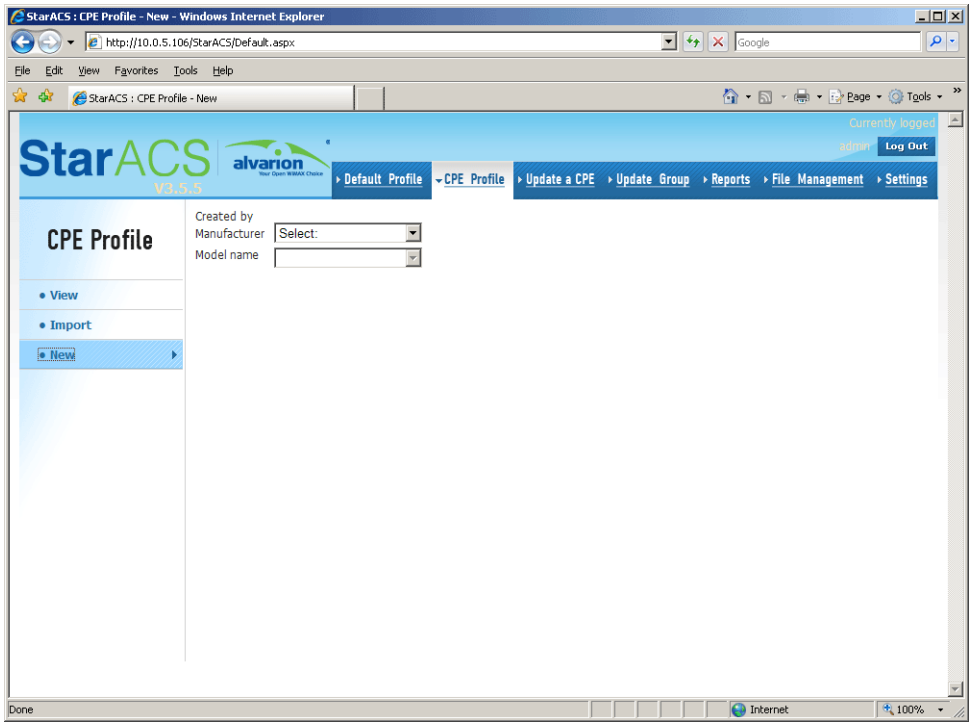

Figure 33: Create a New CPE Profile

3 Select the Manufacturer and Model name. If a template exists for this model, the following page is displayed:

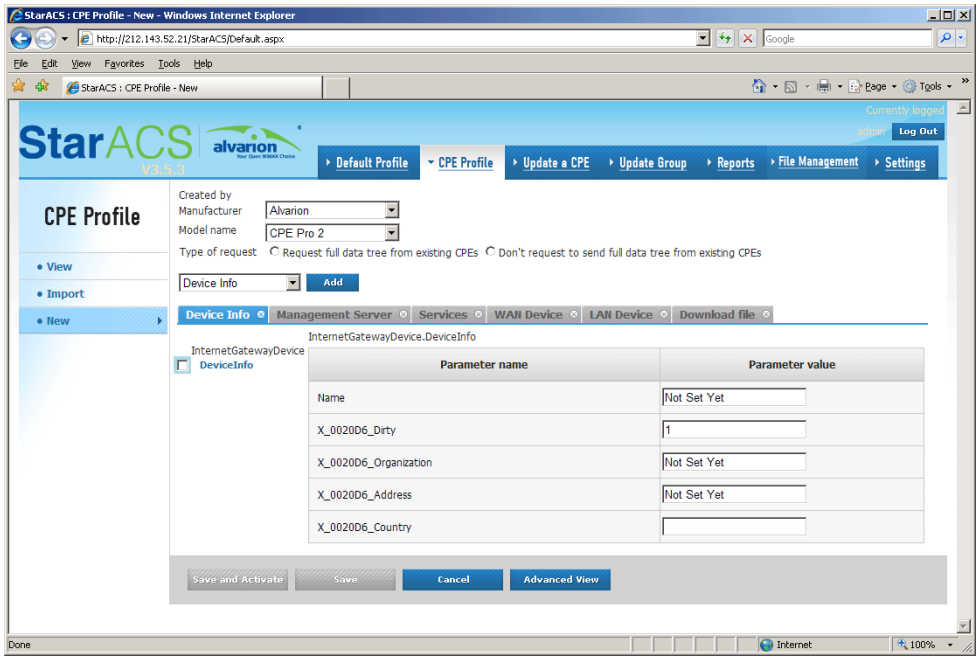

Figure 34: Manufacturer and Model Name

4 Edit the relevant profile parameters according to the CPE model. See "Device Dependent Parameters and File Transfer Configurations" on page 99 for details on the device-dependent parameters.

NOTE

Management Server parameters must always be configured in a profile in order to provide connection data between ACS and the CPE.

7. Updating a CPE

An update to a specific CPE can originate from the following sources:

- Update of an individual CPE under the "Update a CPE" tab
- Update individual CPEs as part of a group update under the "Update group" tab
- CPE settings sent from external systems via northbound interface (API)
- A combination of the above

Each update is broken down by the system into a sequence of single parameter values. This means that if an update contains three different parameters to be changed in a CPE/group of CPEs, the StarACS will create three separate update tasks to be performed per each CPE.

Note that the update tasks are executed according to a queue utilizing FIFO.

The CPE Profile mechanism has its own queue. When a firmware update is sent to the CPE, all other updates will be put on hold until the firmware is updated.

Click the Update a CPE tab to display the following menu options:

- Search
- List

The Search menu option enables listing specific CPE devices. The List menu option lists all CPE devices in the system (see "List Menu Options" on page 47).

7.1 Searching CPEs

Click the Search menu option to enable searching for a device by one of the following parameters:

- Serial Number
- MAC address
- Authentication Username
- Running SW Version
- Shadow SW Version
- Serving BS ID
- Con Req URL (can be used for searches based on WAN IP address if the Search match only option is not checked)

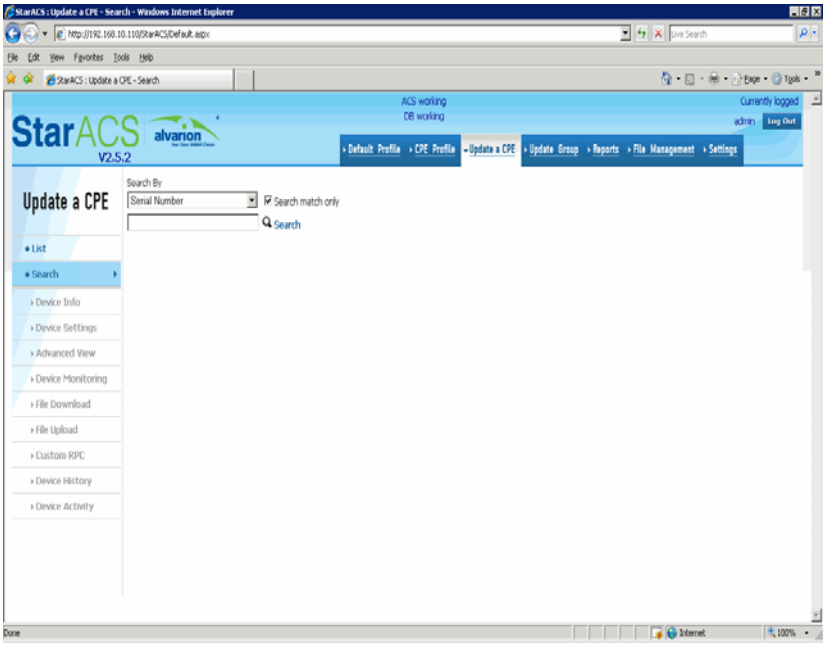

Figure 35: Search Window

To search for CPE devices:

1 Select the parameter type to be searched for from the Search by list.

2 Enter a partial or complete parameter string in the lower text box.

3 To list complete parameter string matches only, check the Search exactly box.

4 Click Search. The list of matching CPE devices is displayed.

In the example below, all CPE devices were searched for serial number containing the string '2_5'.

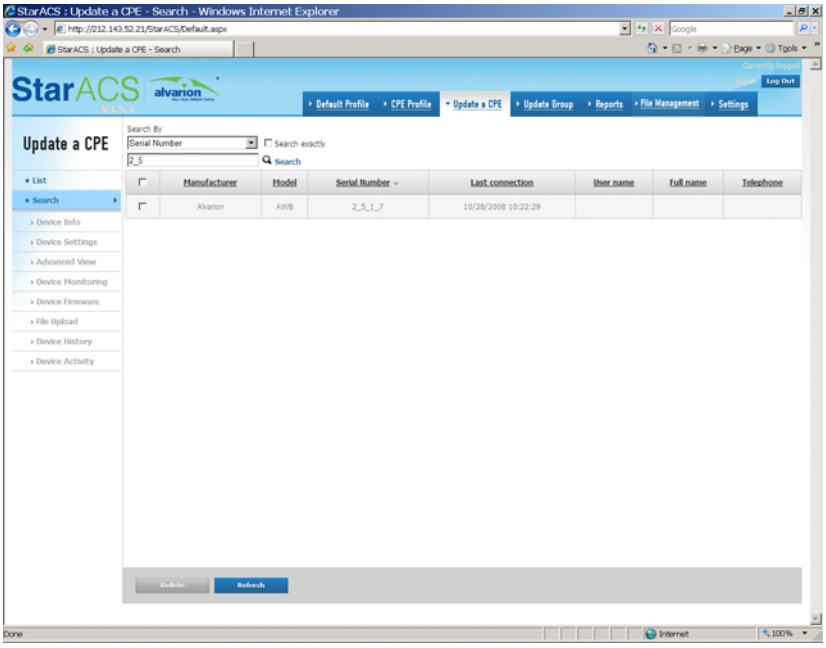

Figure 36: Search Example

7.2 Viewing CPE List

Click the List menu option to list all CPE devices in the system. A table of all devices registered in the system is displayed. The table may be filtered by:

- View
- Manufacturer
- Model name

The following controls are available:

- Edit view - enables to modify the parameters displayed in the current view
- New view - enables to select the parameters to be displayed in a new view
- Delete - deletes the selected CPE from the list
- Refresh - refreshes the display

The view of the table can be changed to display any (or all) of the following parameters:

- Created
- Description
- Device name
- Device summary
- Hardware version
- Info model name
- Manufacturer
- Model name
- Pending tasks
- Provisioning code
- Running SW version
- Serial
- Serving BS ID
- Spec Version
- Status
- Telephone
- Updated
- Uptime
- User Id
- User login

- User name
- User tag
- Zip

A view of the table can be exported to a .csv file.

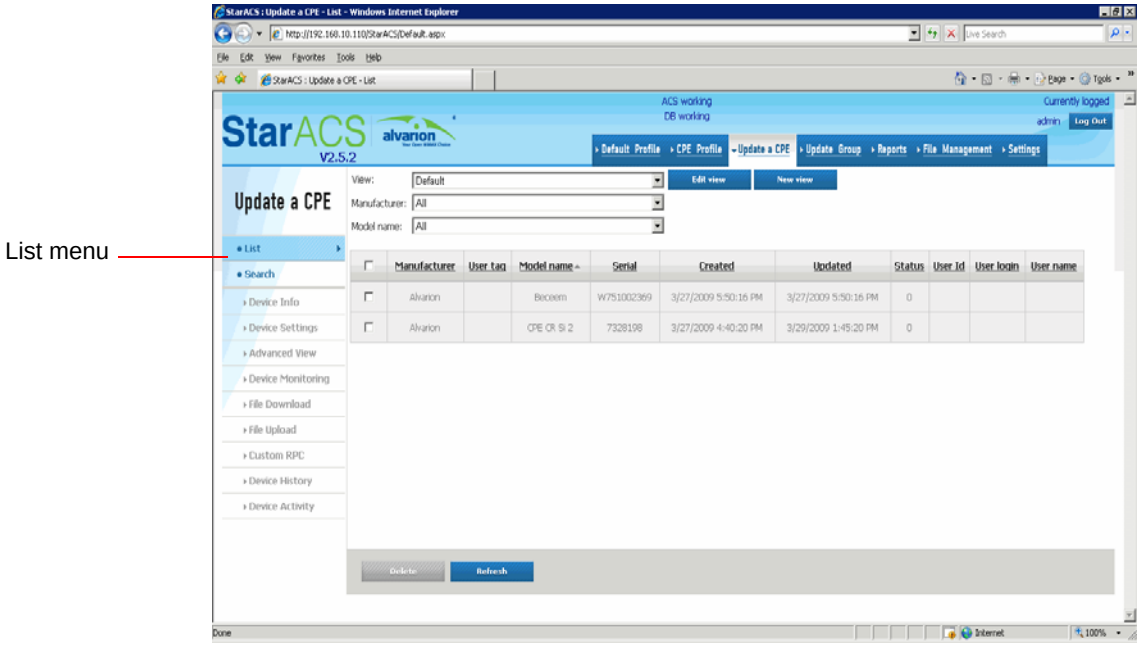

Figure 37: CPEs List

To edit the view of the CPE list:

1. Click Edit view. The Edit custom view page is displayed.
2. Enter a name for the new view and click Next. A list of all the columns is displayed.
3. Select the parameters to be displayed in the Visible column and click Next.
4. Use the Top, Bottom, Up and Down buttons to set the order of the columns and click Next.
5. Click Add Filter to add filters and click Next.
6. Enter filter criteria and click Next.

7 Set the order in which the rows should be sorted and click Finish. The selected parameters will be displayed in the list of CPE devices.

To create a new view of the CPE list:

1 Click New view. The Create new custom view page is displayed.

2 Click Next. A list of all the columns is displayed.

3 Select the parameters to be displayed in the Visible column and click Next.

4 Use the Top, Bottom, Up and Down buttons to set the order of the columns and click Next.

5 Click Add Filter to add filters and click Next.

6 Enter filter criterai and click Next.

7 Set the order in which the rows should be sorted and click Finish. The selected parameters will be displayed in the list of CPE devices.

To export a view of the CPE list:

1 Select a view from the drop-down list.

2 Click Edit view or New View. The Edit or Create new custom view page is displayed.

3 Click Export list. A File Download window is displayed.

4 Click Save and enter a name and path for the file. The file is saved as a .csv document.

7.3 Device Table Actions

After using the Search menu option, a table of devices is displayed. The device parameters include manufacturer, model, serial number, last connection, user name, full name, and telephone number.

The following controls are available for the device table:

- Delete - deletes the device from the device table
- Refresh - refreshes the device table display

- Sort - sorts the device table by selected parameter
- Device Info - displays information for a selected device and enables the List menu options

To delete a device from the device table:

1. Check the box for the device entry in the table
2. Click Delete. The device is deleted from the device table.

To refresh the device table display:

Click Refresh. The device table display is refreshed.

To sort the device table by parameter:

Click the selected parameter name in the device table header row. The device table display is sorted by the selected parameter in ascending order (▲). To sort in descending order (▼), click the selected parameter name again.

To display information for a device and enable the List menu options:

Select a device from the device table. The Device Info page is displayed and the List menu options are enabled.

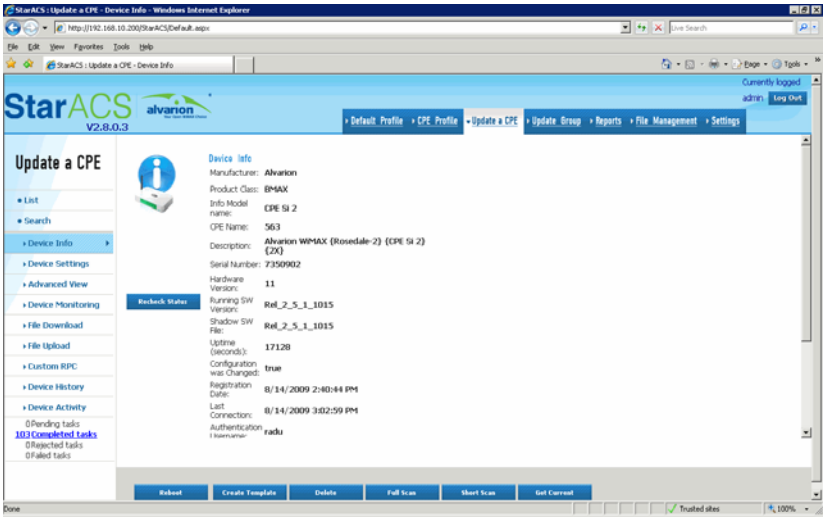

Figure 38: Device Info Page

7.4 List Menu Options

After selecting a device from the device table, the Device Info page is displayed and the List menu options are enabled (Figure 38).

The List menu contains the following options (detailed in the next sections) for the selected device:

- Device Info
- Device Settings
- Advanced View
- Device Monitoring
- File Download
- File Upload
- Custom RPC
- Device History
- Device Activity

- Task Information:
  - Pending tasks
  - Completed tasks
  - Rejected tasks
  - Failed tasks

7.4.1 Device Info

The Device Info option opens the Device Info page (Figure 38), which displays general device parameters including manufacturer, OUI, model, description, serial number, hardware version, firmware version, up time, notification about changes done to the device, a link to the local web page of the device, and a list of methods supported by the device.

The controls that are available on the Device Info page are device specific and differ for the different devices. The following controls are available:

Table 5: Device Info Controls

Control	Description	Rodesdale 2	Sequans
Reboot Device	Reboots the device	Yes	Yes
Create Template	Creates a template for the device (a prerequisite for creating a new CPE profile. See also “Creating a New CPE Profile” on page 37	Yes	Yes
Delete	Deletes the device from the system	Yes	Yes
Full Scan	Searches all the base stations that have connected the CPE (CPEs based on the Rosedale 2 chip only)	Yes	No
Short Scan	Scans by a frequency table (CPEs based on the Rosedale 2 chip only)	Yes	No
Get Current	This is active when Configuration was Changed is set as true. Pressing this control button sets Configuration was Changed to false and the list of all parameters is retrieved from the device. (CPEs based on the Rosedale 2 chip only)	Yes	No
Run from Shadow	Performs Run from Shadow (CPEs based on the Sequans chip only).	No	Yes

Table 5: Device Info Controls

Control	Description	Rodesdale 2	Sequans
Set as Main	If the software version is running from shadow, performs Set as Main (CPEs based on the Sequans chip only).	No	Yes
Recheck Status	Rechecks the device status (Note: To conserve system resources, use this control sparingly)	Yes	Yes

7.4.2 Device Settings

The Device Settings page displays device parameters and enables their configuration. The device parameters are organized by group tabs, such as Management Server, Services, WAN Device, LAN Device, Authentication. It is only a sub-set of parameters; the full list is in the Advanced View (see "Advanced View" on page 51). For information about parameters, see "Default Profile Parameters" on page 97.

The following controls are available on the Device Settings page:

- Send Update - sends the update to the device
- Get Current - retrieves the current value of the device parameters

To edit parameters in a group of settings:

1 Click the parameter group tab. The parameter group table is displayed. The relevant device parameters are enabled for editing.

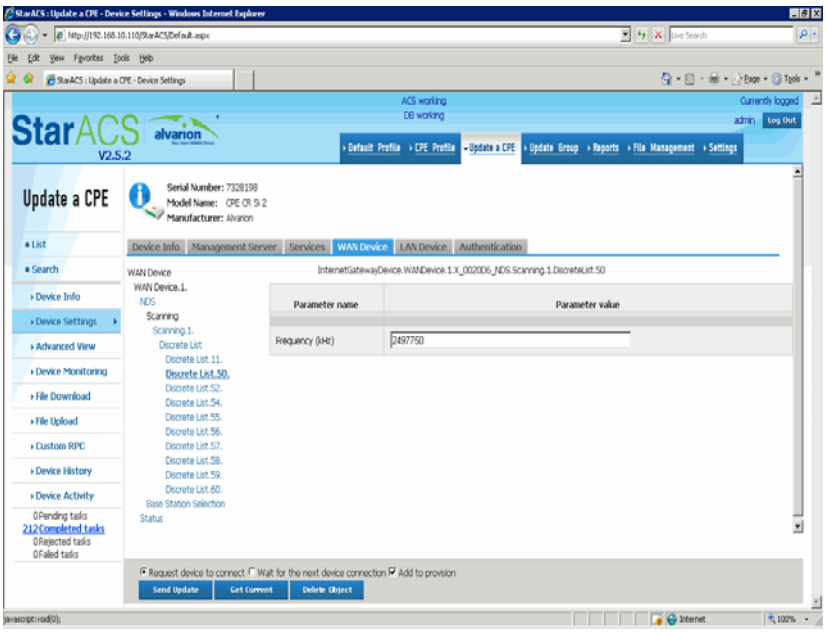

Figure 39: Device Settings

2 Edit the desired parameter values. Refer to "Device Dependent Parameters and File Transfer Configurations" on page 99.

3 Select the control options. The following controls are available:

- Request device to connect - sends a request to the device to connect and receive the updated parameters
- Wait for the next device connection - updates the device parameters on the next periodic connection initiated by CPE automatically (when periodic informing is enabled)
- Add to provision - controls which parameters are added to provisioning for each device together with the parameters in the CPE Profile.
- Send Update - sends the update to the device
- Get Current - retrieves the current parameter values
- Add Object - creates a new instance of a multi-instance object, a collection of parameters and/or other objects for which multiple instances are defined
- Delete Object - deletes an instance of a multi-instance object

7.4.3 Advanced View

The Advanced View page displays all the parameters in the TR-069 tree and enables parameter configuration. For detailed information about device dependent parameters see Section 13 (“Device Dependent Parameters and File Transfer Configurations” on page 99).

The following controls are available on the Advanced View page:

- Send Update - sends the update to the device
- Get Current - retrieves the current value of the device parameter
- Add Object -creates a new instance of a multi-instance object, a collection of parameters and/or other objects for which multiple instances are defined
- Delete Object -deletes an instance of a multi-instance object

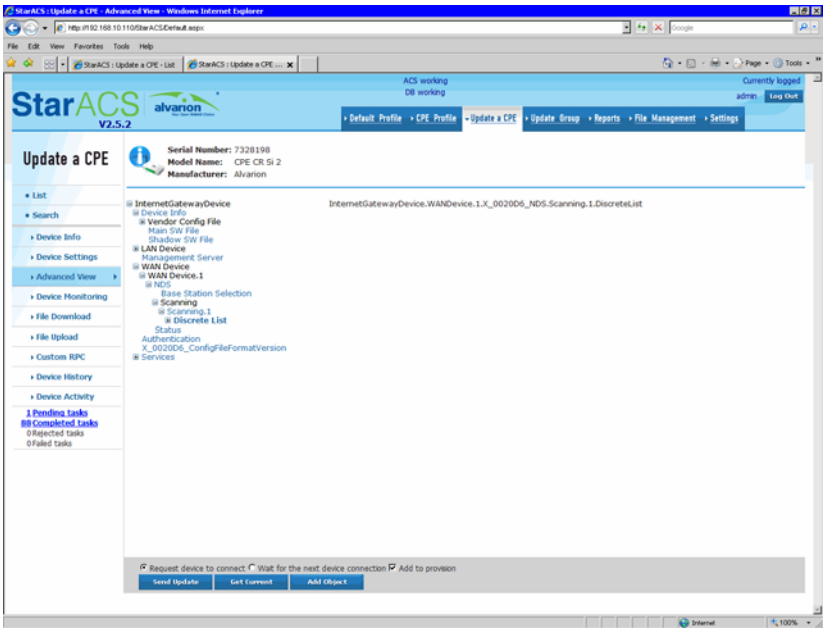

Figure 40: Typical Advanced View Page

To edit parameters in the tree:

1 Select the desired parameter group by clicking the corresponding tree branch in the left pane. Drill down the tree if necessary.

2 Edit the selected parameter values. To view the complete object name of the parameter, point the mouse to the parameter name in the table.

3 Select the control options. The following controls are available:

- Request device to connect - sends a request to the device to immediately connect and retrieve the updated parameters
- Wait for the next device connection - updates the device parameters on the next connection or next periodic inform.
- Send Update - sends the update to the device
- Get Current - retrieves the current parameter values

7.4.4 Device Monitoring

The Device Monitoring option opens the Device Monitoring page, which displays the parameters that can be monitored for the particular device.

The following controls are available on the Device Monitoring page:

- Start - retrieves counters for selected parameters at a defined interval (default 30000 ms) for as long as the page remains open.
- Stop - stops the counters for the selected parameters
- Refresh - retrieves counters for selected parameters one time one time only

To retrieve counters:

1 Select the check-box(es) for the counters, or select the top check-box to select all the parameters.

2 Click Start; a task is sent to retrieve the information, which may take some time.

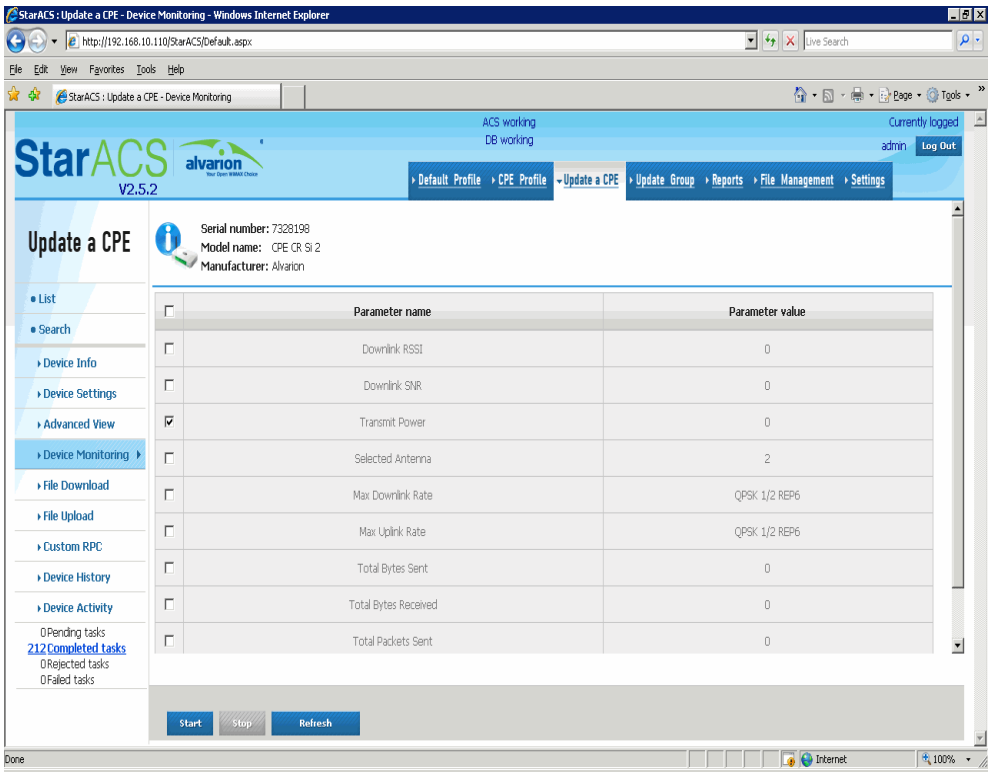

Figure 41: Device Monitoring Page

7.4.5 File Download

The File Download option opens the File Download page, which enables downloading firmware image or vendor configuration files to the CPE device.

The firmware image file must be uploaded to the TFTP/HTTP server prior to executing the firmware update. Once the image file has been uploaded, you need to supply the location to access the image file on the TFTP/HTTP to be used by the CPE.

NOTE

For details about the configuration for a specific device refer to Section 13.

The following fields are available on the File Download page:

- File type - selects the type of file. The possible file types are Firmware Image, Web Content (currently not applicable) and Vendor Configuration File

- Select file location - selects the location of the file. The possible values are From list, Manually and Restore (for Vendor Configuration File type only).

The following controls are available on the File Download page:

- Send Update - sends the file update to the CPE
- Cancel - cancels the action

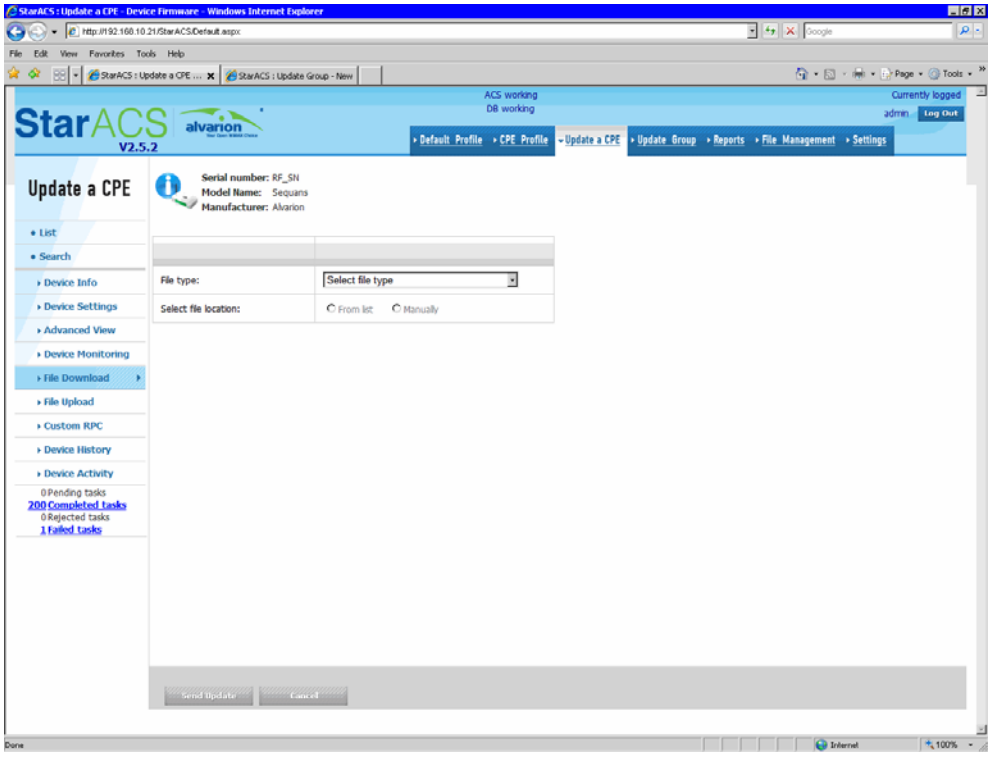

Figure 42: File Download Page

To update a file:

1. Select the File type from the list.
2. Modify the following parameters as required:

Table 6: File Download Parameters

Parameter Name	Description	Range
File type	The type of file used for download	Firmware Image Vendor Configuration File
Description	Description of the current file	Optional value
Select file location	Select the location from where the file will be downloaded	■ From list ■ Manually ■ Restore (for Vendor Configuration File)
File name	The name of the file as it appears in File Management	
Url	The URL for the file transfer server	Device dependent value
Target location	The target location for the file transfer server	Device dependent value
User Name	User Name for the file transfer server	Leave empty
Password	Password for the file transfer server	Leave empty
File size	File Size in KB	File Size in KB

3 Select the file location.

■ If you chose From list, Figure 43 is displayed:

NOTE

In order to use this option the following conditions should be met:

1. The File Server settings should be according to current CPE type (see Section 4.6).
2. The file to be downloaded should be loaded to the StarACS file system (see Section 10).

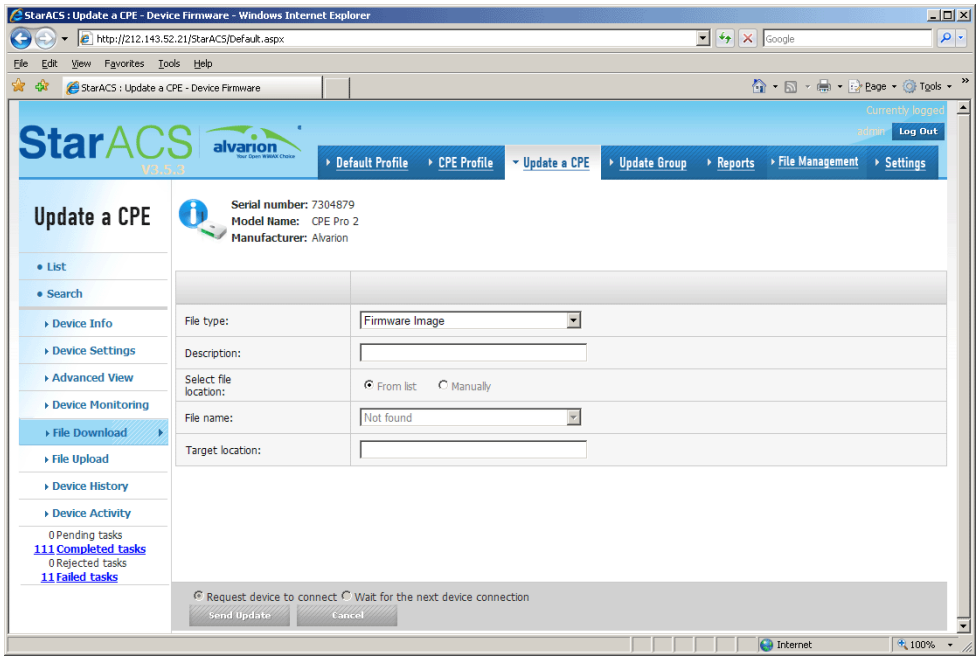

Figure 43: Select File from List

a Select the File name from the list. (The list can be modified in the File Management area of the application.)

b Leave the Target location field empty.

- If you chose Manually, the following page is displayed:

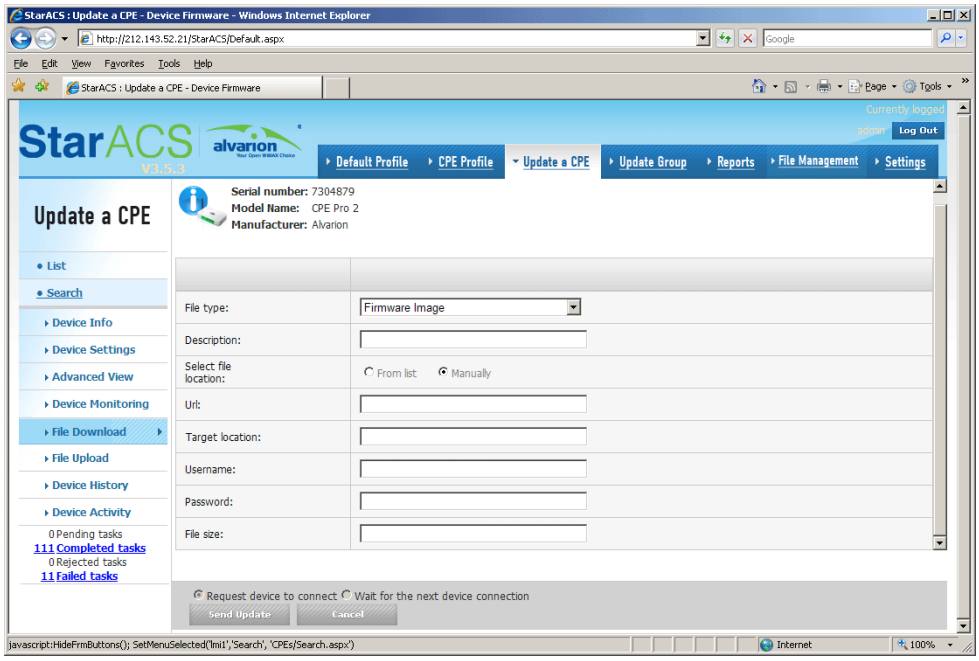

Figure 44: Manual File Selection

a Enter the URL from which the file is downloaded (the values are CPE dependent).

b Enter a Description (optional).

- If you chose Restore (Vendor configuration file only), the following page is displayed:

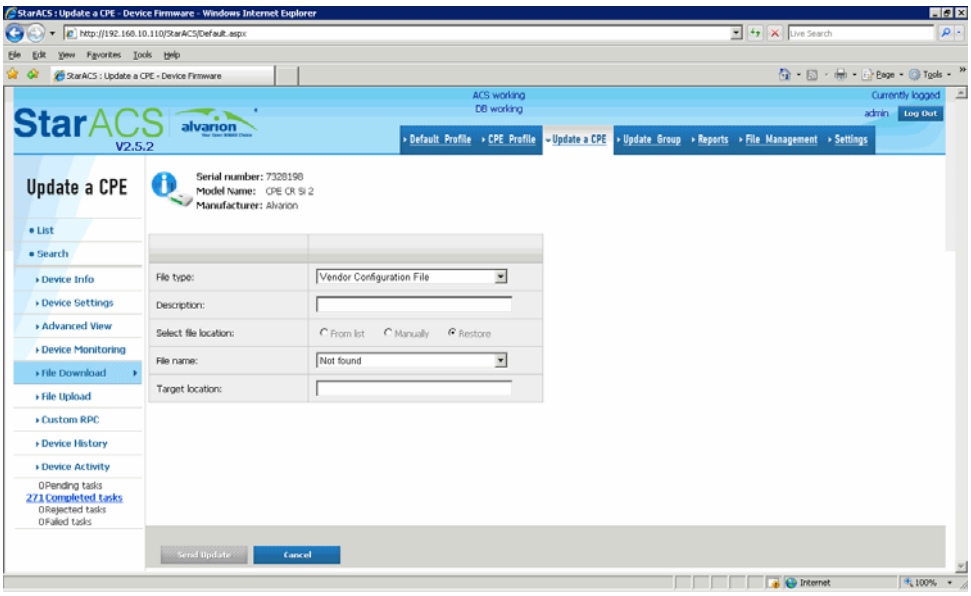

Figure 45: Restore Vendor Configuration File

a Select the File name from the list.

b Leave the Target locationfield empty.

4 Click Send Update. The firmware update request is sent.

7.4.6 File Upload

The File Upload page enables uploading CPE vendor files to the file server.

The following fields are available on the File Upload page:

- File Type - selects the type of file. The possible file types are Vendor Configuration File and Vendor Log File (not applicable).
- Select target type - select the target destination of the file. The possible values are Default site and Manually enter URL.

The following controls are available on the File Upload page:

- Send Update - sends the file update
- Cancel - cancels the action

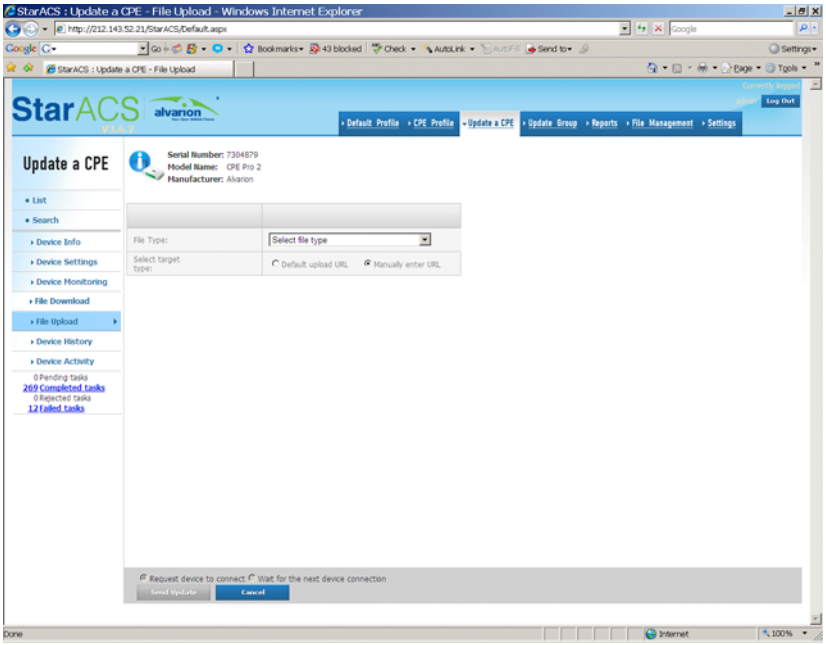

Figure 46: File Upload Page

To upload a file:

1 Select the File type from the list.

2 Modify the following parameters as required:

Table 7: File Upload parameters

Parameter Name	Description	Range
File type	The type of file used for upload	Vendor Configuration File
Description	Description of the current file	Optional Value
Select target type	Select the location to where the file will be uploaded	■ Default Upload URL ■ Manually enter URL
Destination URL	The URL for the file transfer server	CPE dependent value
User Name	User Name for the file transfer server	
Password	Password for the file transfer server	

3 Specify how to find the target destination: Default upload URL or Manually enter URL.

4 Enter the file name.

- If you chose Default upload URL, the following page is displayed:

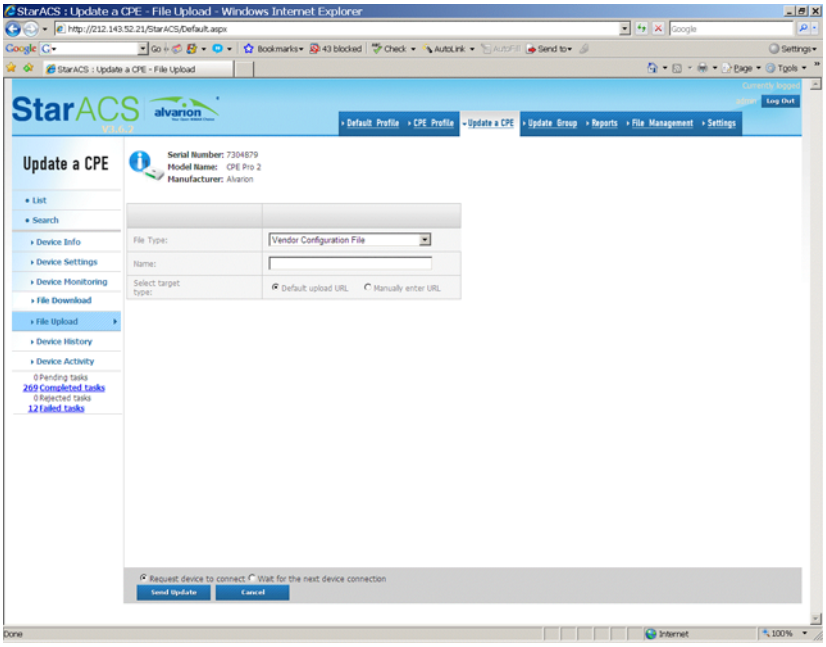

Figure 47: File Upload - Default Site

- If you chose Manually enter URL, the following page is displayed:

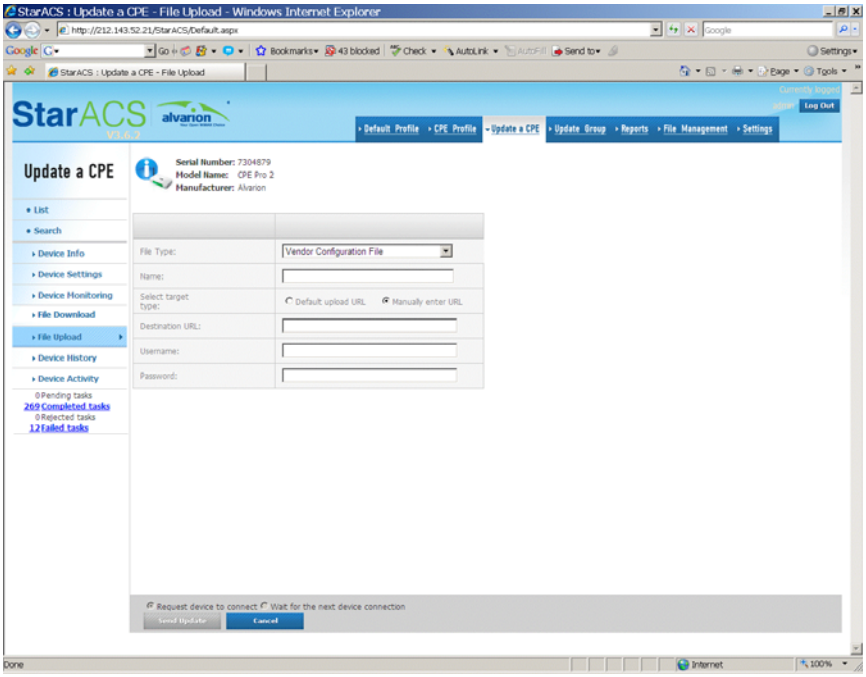

Figure 48: File Upload - Manually Enter URL

a Enter the destination URL (the values are CPE dependent).

5 Click Send Update. The file is uploaded to the target destination.

7.4.7 Custom RPC

The Custom RPC option displays the Custom RPC page. It enables manually configuring commands and sending them to the device. This is useful for debugging CPEs or for sending methods that are not supported by StarACS to the device. All methods supported by the device can be used.

The following fields are available on the Custom RPC page:

- Method name - selects the RPC Method supported by the CPE. The information is retrieved directly from the CPE as a response to the method sent to Get RPC Methods on discovery.
- Request - contains the SOAP message from the SOAP Body element.

The following controls are available on the Custom RPC page:

- Send Update - sends the command to the device

- Cancel - clears the screen without sending the configured information to the device

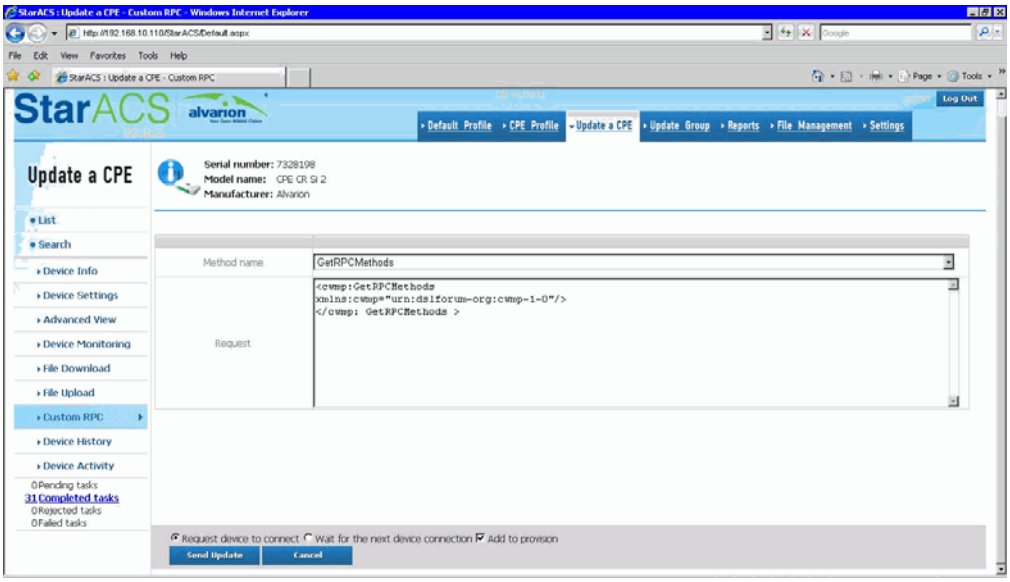

Figure 49: Custom RPC Page

7.4.8 Device History

The Device History option opens the Device History page. The Device History page displays recorded events for the device for 48 hours from the last inform received.

The following fields are available on the Device History page:

- Show all - displays all events
- Show by date - displays events that occurred on a specific date

The following controls are available on the Device History page:

- Refresh - refreshes the page
- Delete - deletes all the events in the current view
- Save - opens or downloads an xls file with all the events listed

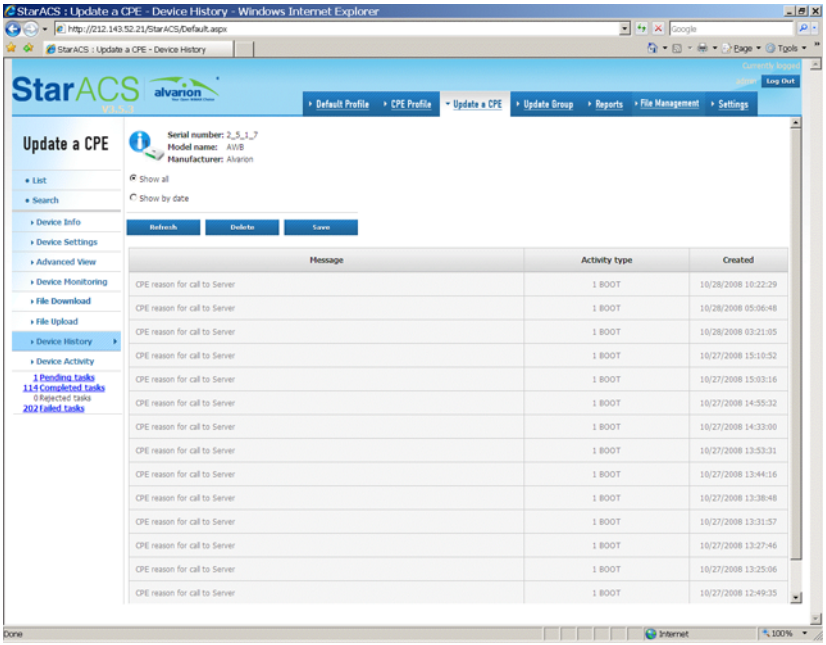

Figure 50: Device History

7.4.9 Device Activity

The Device Activity option opens the Device Activity page, which displays selected tasks for the device executed on specified dates.

The following fields are available on the Device Activity page:

- Show all - displays all tasks
- Show by date - displays tasks that occurred on a specific date
- Task type - selects the task type
- Task method - selects the task method

The following controls are available on the Device Activity page:

- Refresh - refreshes the display
- Delete - deletes selected tasks

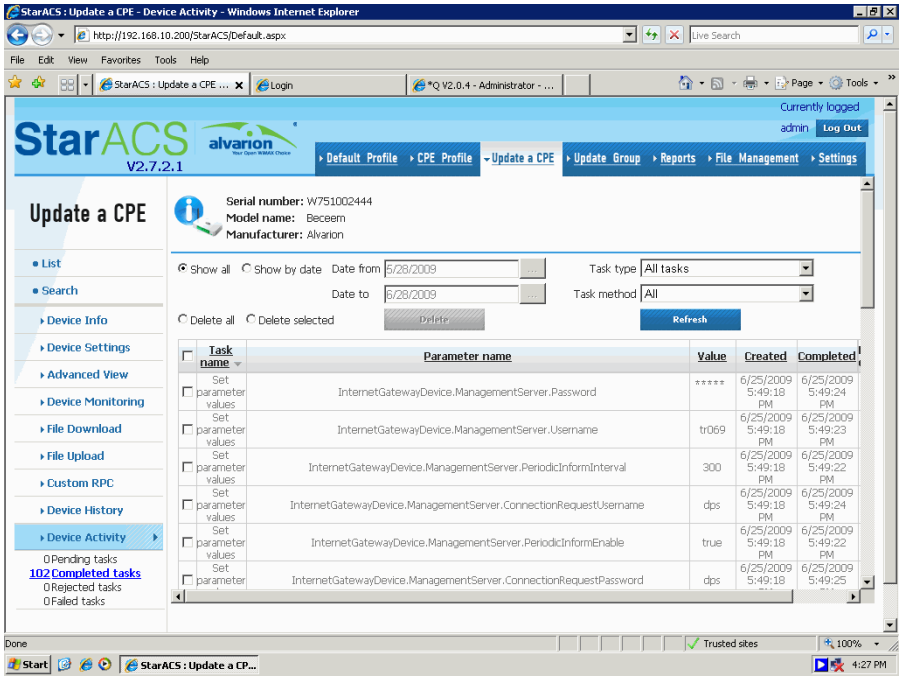

Figure 51: Device Activity

7.4.10 Pending, Completed, Rejected, and Failed Tasks

Shortcut links for displaying pending, completed, rejected, and failed tasks are available directly below the Device Activity menu option. If there is at least one task in the category, a shortcut link is provided. Clicking the link displays the Device Activity page for the specified task type.

For example, clicking the Pending tasks link displays the page below:

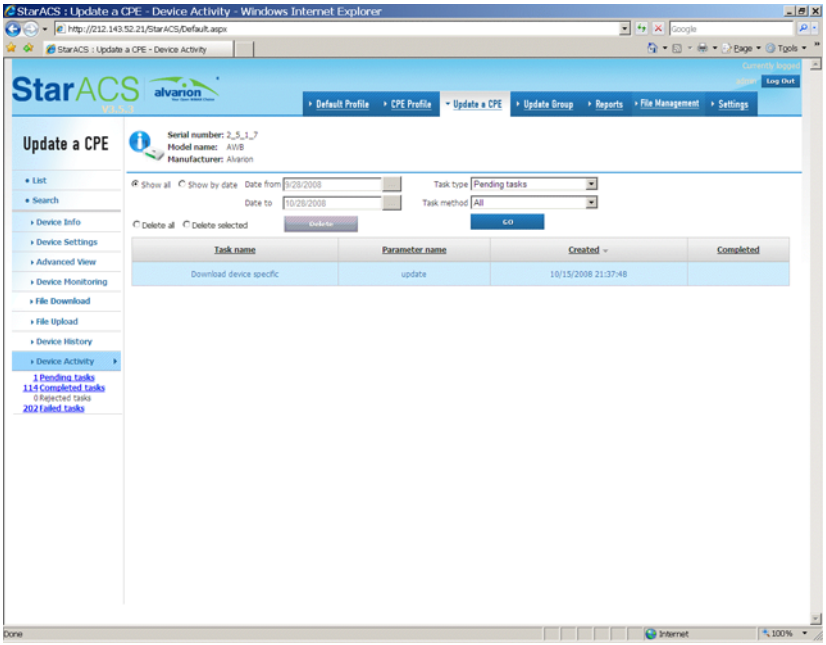

Figure 52: Pending, Completed, Rejected, and Failed Tasks

Failed task entries are color-coded pink. The error code is displayed as a tool tip when the mouse hovers over the failed task (see Table 8).

Table 8: Error Codes

Fault code	Description
TR-069 predefined error codes	
0	No Fault
9000	Method not supported
9001	Request denied (no reason specified)
9002	Internal error
9003	Invalid arguments
9004	Resources exceeded (when used in association with SetParameterValues, this MUST not be used to indicate parameters in error)
9005	Invalid parameter name
9006	Invalid parameter type (associated with SetParameterValues)
9007	Invalid parameter value (associated with SetParameterValues)
9008	Attempt to set a non-writable parameter (associated with SetParameterValues)

Table 8: Error Codes

Fault code	Description
9009	Notification request rejected (associated with SetParameterAttributes method)
9010	Download failure (associated with Download or TransferComplete methods)
9011	Upload failure (associated with Upload or TransferComplete methods)
9012	File transfer server authentication failure (associated with Upload, Download, or TransferComplete methods)
9013	Unsupported protocol for file transfer (associated with Upload and Download methods)
Vendor Specific: File Transfer 9800-9819	
9800	Incorrect File Type parameter
9801	Can not resolve URL of TFTP server
9802	Invalid Target File Name
9803	Invalid File Size
9804	TFTP failed, Corrupted File Format
9805	Configuration File Invalid
9806	MD5 Check Failed
Vendor Specific: AddObjectResponse 9820-9829	
9820	Max services exceeded
9821	Instance Already Exist

8. Updating a Group of CPEs

The Update Group page enables applying parameters to a group of CPE devices of the same manufacturer and model. The Update Group menu enables the following options:

- “Viewing CPE Groups” on page 67
- “Importing a File for Updating a Group” on page 72
- “Creating a New CPE Group” on page 74

8.1 Viewing CPE Groups

Click the View menu option to display a table of CPE update groups:

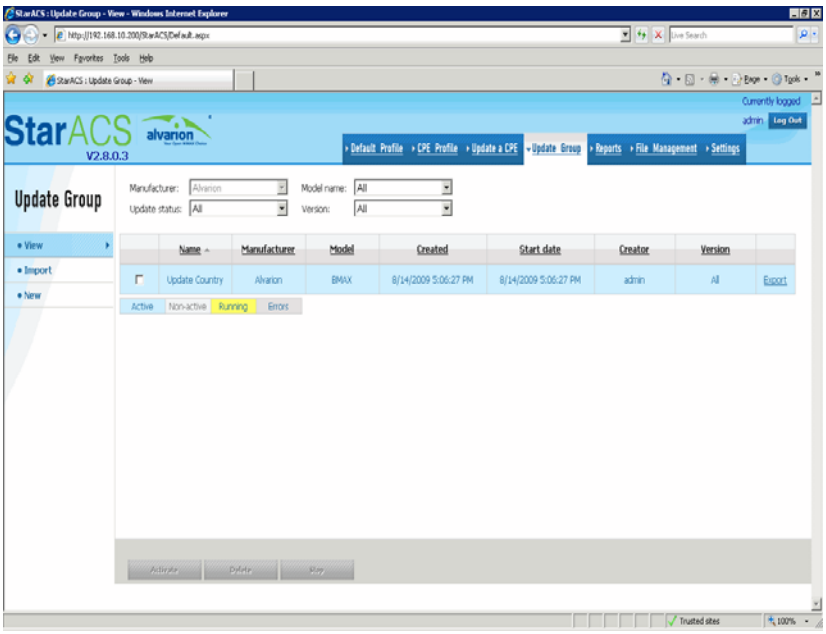

Figure 53: Update Group - View

The table may be filtered by:

- Manufacturer
- Model name
- Version

- Update status - the update status of the group profile. The possible values are:
  - All - all groups are displayed (no filtering)
  - Active - CPE groups that are still in the update process are displayed
  - Not active - only non-active groups are displayed
  - Scheduled - pending CPE groups that are scheduled for update in the future are displayed
  - Running - CPE groups that were scheduled and are currently in the update process are displayed
  - Error - groups whose update process failed are displayed

The table displays the following fields:

- Name - CPE update group name
- Manufacturer - CPE manufacturer
- Model - CPE model name
- Created - CPE update group creation date and time
- Start Date - date when group was created
- Creator - username who created the CPE update group
- Version - CPE update group version number

Entries are color-coded as follows:

- Active - blue
- Non-active - gray
- Errors - pink

The following actions are available:

- Sort - sorts the table by the selected field

- Edit - edits the selected update group
- Export - exports the selected update group in xml format
- Activate - activates the selected update group
- Delete - deletes the selected update group
- Stop - stops a task that is running

To sort the update group table by a field:

Click the selected field name in the update group table header row. The update group table is sorted by the selected field in ascending order (▲). To sort in descending order (▼), click the selected field name again.

To export an update group:

Click Export for the selected group profile entry in the table. A dialog box prompts if to open or save the profile file in xml format.

To activate an update group:

1. Check the box in the row for the selected group profile entry in the table.
2. Select whether the profile is to be activated immediately by requesting the device to connect or later by waiting for the next device connection.
3. Click Activate. The group profile is activated and the table row is color-coded blue.

NOTE

Once activated, CPE groups can not be deactivated. They remain active for logging purposes and to maintain the polling configuration of specific parameters.

To delete an update group:

1. Check the box in the row for the selected group profile entry in the table.

2 Click Delete. The group profile is deleted.

NOTE

As soon as a CPE group is deleted, the polling that was activated for specific parameters ceases, but the information already collected remains in the device_stats table in the database.

To stop an update group:

1 Check the box in the row for the selected group profile entry in the table .

2 Click Stop. The update for the group is stopped.

NOTE

Only running groups can be stopped.

To edit an update group:

NOTE

Only deactivated groups can be edited.

1 Click any field in the row of the selected entry in the table. The group profile parameter table is displayed.

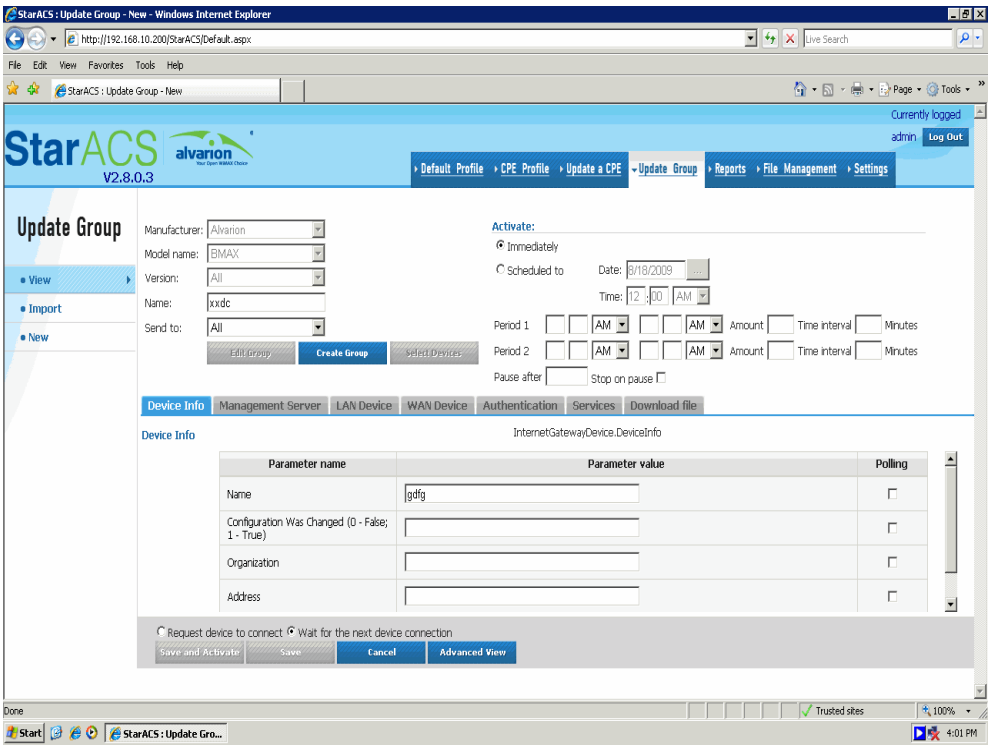

Figure 54: Group Profile Parameter Table

2 Select whether to activate the group profile immediately or schedule its activation at a later date and time.

3 Select the recipients of the file. The possible values are:

- All - sends to all recipients
- Individual - sends to individuals only
- Import from file - sends to recipients listed in the imported file. The file must have the following format:

```
<?xml version="1.0"?>
<Devices>
<Device>serial_number</Device>
 <Device>serial_number</Device>
</Devices>
```

NOTE

If Individual or Import from file are selected, it is possible to **Select a Device**. This enables to select from all the CPEs in the network or a import a file with a predefined list of CPEs.

4 Enter one or two time periods for CPE updates.

5 Enter the number of the of CPEs to be updated in the Amount field and the time interval (in minutes) between updatesfor the particular period .

6 Enter the number of devices after which testing should be paused in the Pause after field. For example; if you want to test a new update group on only 10 devices, enter 10 in the Pause after field. The update will stop after updating 10 devices once only. If the Stop on pause field is checked, the update will pause each time after updating 10 devices.

7 Click the parameter group tab (Management Server, etc.).

8 Edit the parameter values.

9 To periodically sample the selected parameter, check the Polling box. The information is stored in the device_stats table in the database.

10 To send the files to the CPE, click Download file.

11 To view the entire parameter-tree, click Advanced View.

12 Select whether to activate the update group actively or passively by choosing Request device to connect or Wait for the next device connection.

13 To save the profile without activating it, click Save. To save the profile and activate it, click Save and Activate. The update group is saved. If activated, the table row is color-coded blue.

8.2 Importing a File for Updating a Group

To import an update file :

1 Click the Import menu option to import an update group. The following page is displayed:

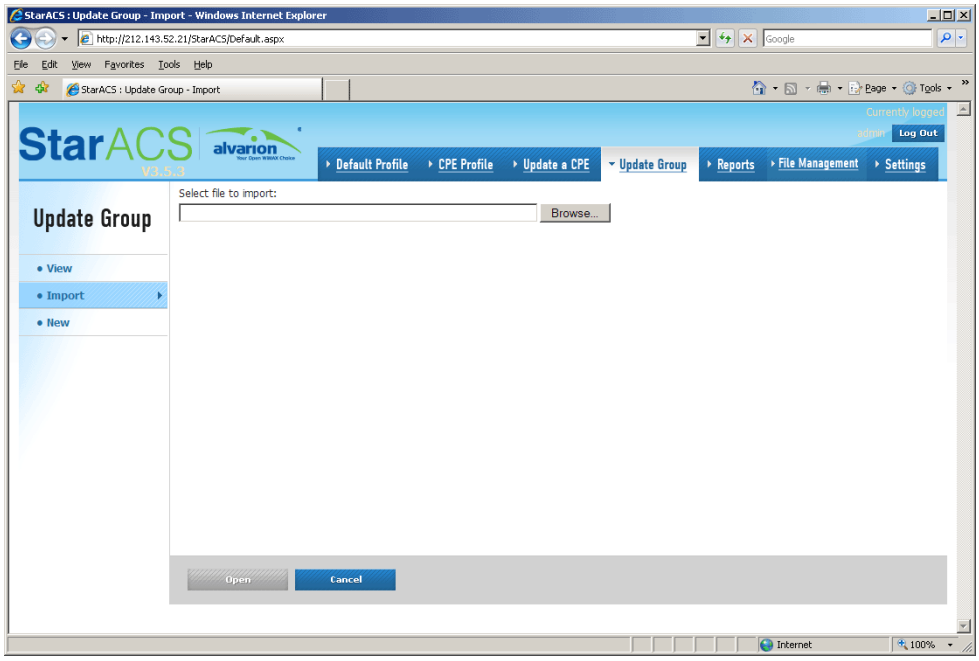

Figure 55: Update Group - Import

2 Enter the file name or click Browse to select the file to import.

3 Click Open. The imported group parameters are displayed.

8.3 Creating a New CPE Group

To create a new CPE group you need to first create a template for the CPE model.

To create a new group:

1 Click the New menu option. The following page is displayed:

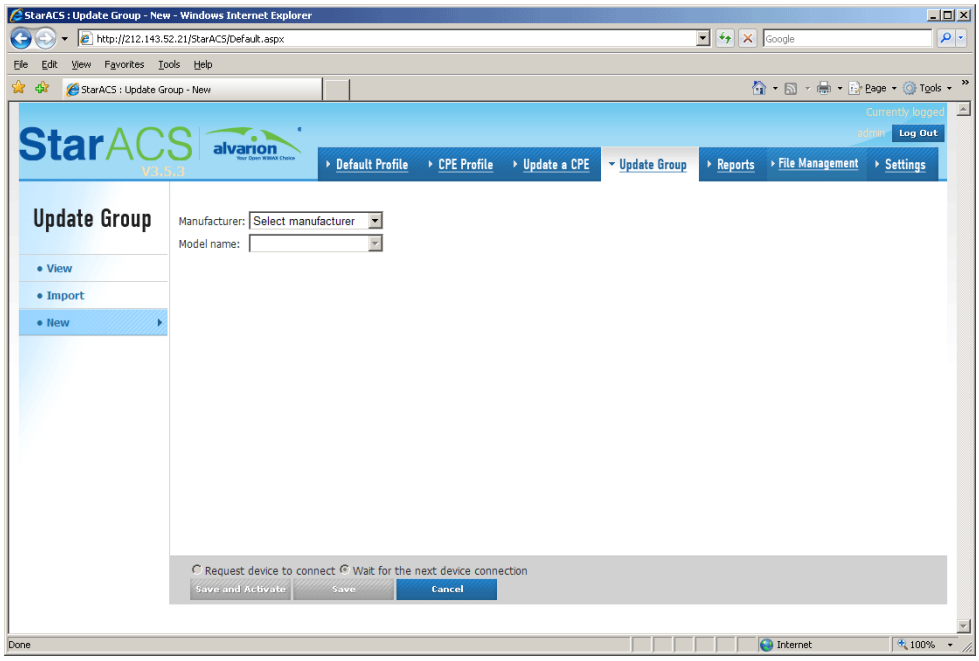

Figure 56: Create a New Update Group - 1

2 Select the Manufacturer and Model name. The following page is displayed:

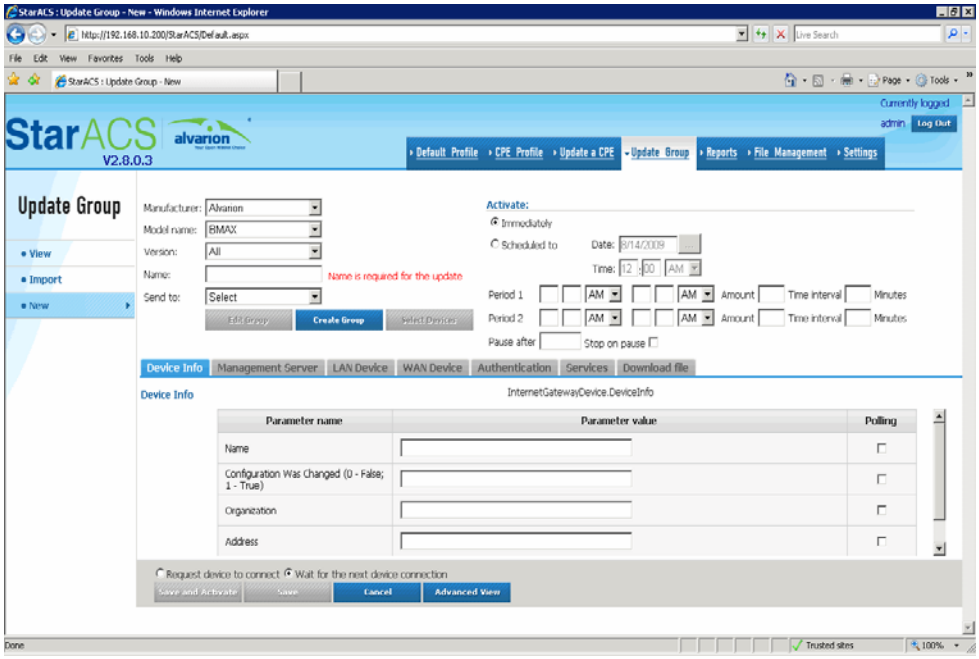

Figure 57: Create a New Update Group - 2

3 Enter a name for the group.

4 Select whether to activate the group profile immediately or schedule its activation at a later date and time.

5 Select the recipients of the file. The possible values are:

- All - sends to all recipients
- Individuals - sends to individuals only
- Import from file - sends to recipients listed in the imported file. The file must have the following format:

```
<?xml version="1.0"?>
<Devices>
<Device>serial_number</Device>
 <Device>serial_number</Device>
</Devices>
```

6 Enter one or two time periods for CPE updates.

7 Enter the number of the of CPEs to be updated in the Amount field and the time interval (in minutes) between updatesfor the particular period .

8 Enter the number of devices after which testing should be paused in the Pause after field. For example; if you want to test a new update group on only 10 devices, enter 10 in the Pause after field. The update will stop after updating 10 devices once only. If the Stop on pause field is checked, the update will pause each time after updating 10 devices.

9 Click the parameter group tab (Management Server, etc.).

10 Edit the parameter values.

11 To periodically sample the selected parameter, check the Polling box. The information is stored in the device_stats table in the database.

12 To send the files to the CPE, click Download file.

13 To view the entire parameter-tree, click Advanced View.

14 Click Create group. The Create new group page is displayed.

15 Enter a name for the groupand click Next. The Filter records page is displayed.

16 Click Add Filter to add filters and click Next.

17 Enter filter criteria and click Next.

18 Set the order in which the rows should be sorted and click Finish. The selected parameters will be displayed in the list of groups.

19 Select whether to activate the update group actively or passively by choosing Request device to connect or Wait for the next device connection.

20 To save the profile without activating it, click Save. To save the profile and activate it, click Save and Activate. The update group is saved. If activated, the table row is color-coded blue.

9. Reports

Click the Reports tab to display the following options:

- CPE distribution report
- CPE registration report
- Pending tasks
- Rejected tasks

- Activity
- Update reports

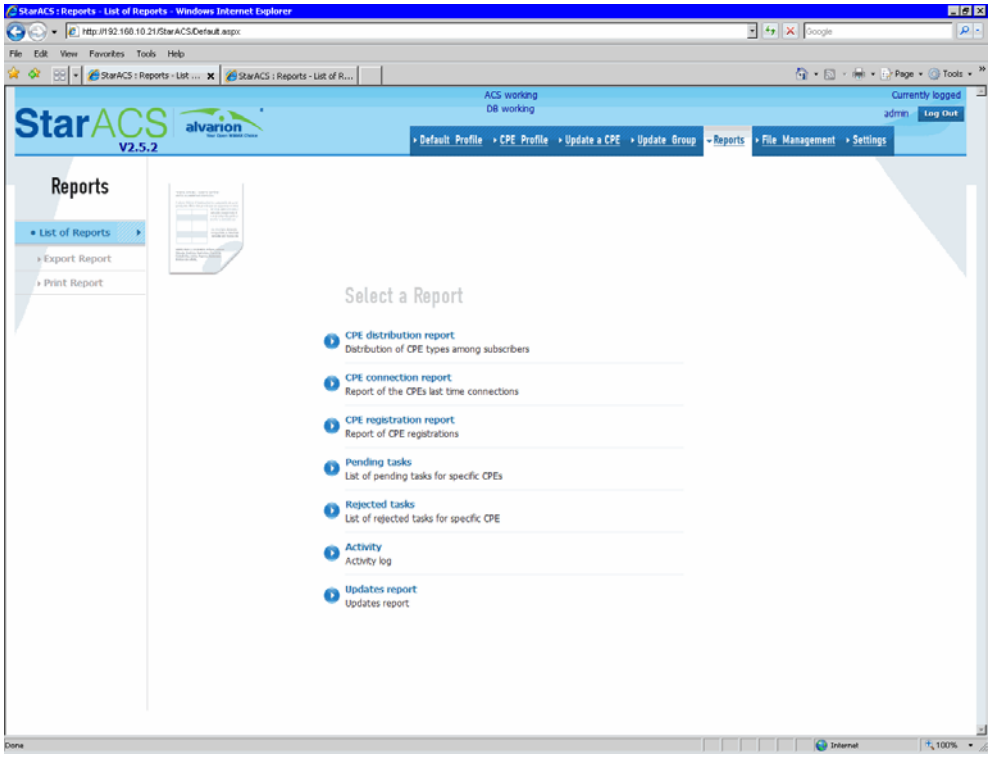

Figure 58: Reports Window

All of the reports can be printed or exported to a table in a spreadsheet.

To print a report:

From the report, click Print Report. A print dialog opens, enabling you to print the report table.

To export a report:

From the report, click Export Report. A dialog opens, enabling you to open or save the table as an Excel spreadsheet.

9.1 CPE Distribution Report

Click the CPE distribution report option to enable searching for connection reports for device by the following parameters:

- Manufacturer

The following controls are available:

- Show All
- Show by specific date. The table that is genereated only shows those CPEs that were registered on the selected date.

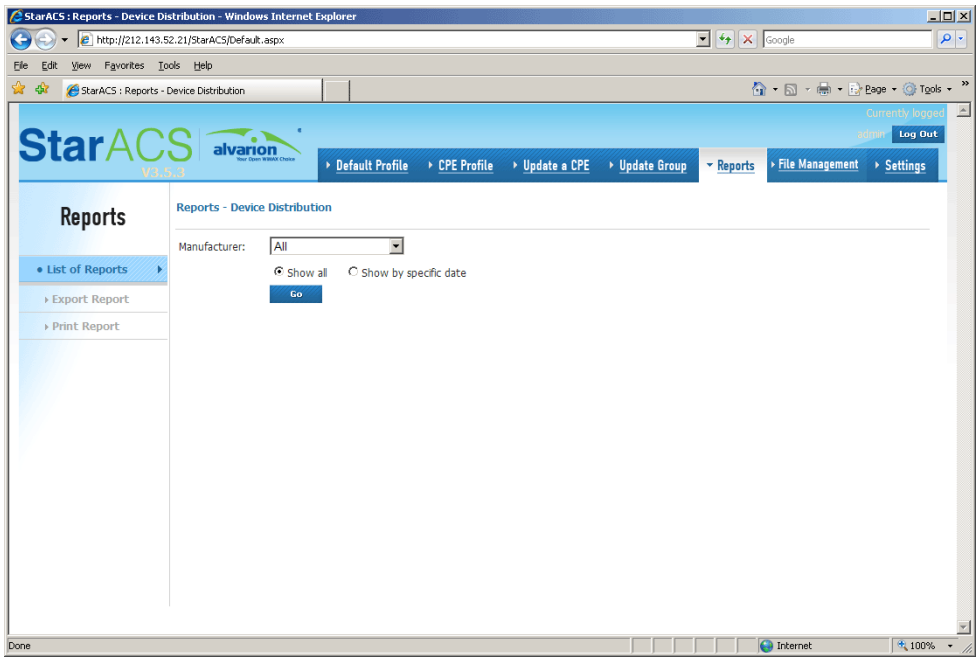

Figure 59: CPE Distribution Report Window

To display a distribution report:

1. Select the CPE device manufacturer and model from the lists, or specify All.
2. Click Go. The distribution report table for the selected devices is displayed and the Export Report and Print Report options are enabled.

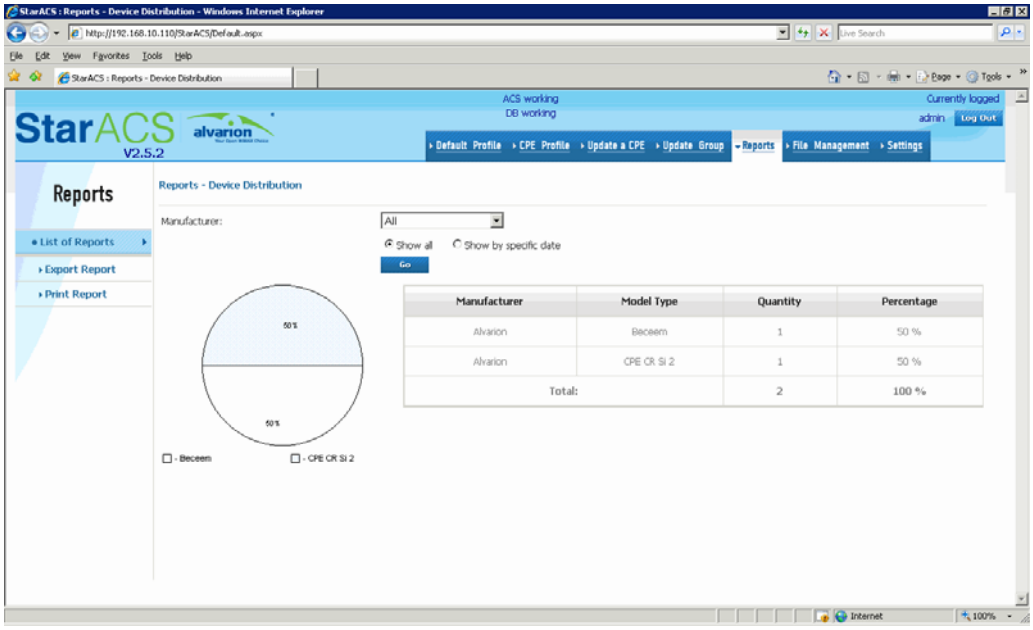

Figure 60: CPE Distribution Report

9.2 CPE Registration Report

The Registration report is an inventory report of the CPE, that lists the times when the last contact with the CPE was created. A CPE cannot be connected but not registred. However, a CPE can be registerd but not connected, which is the usual state.

Click the CPE registration report option to enable searching for registration reports for devices by the following parameters:

- Manufacturer
- Model
- From Date
- To Date

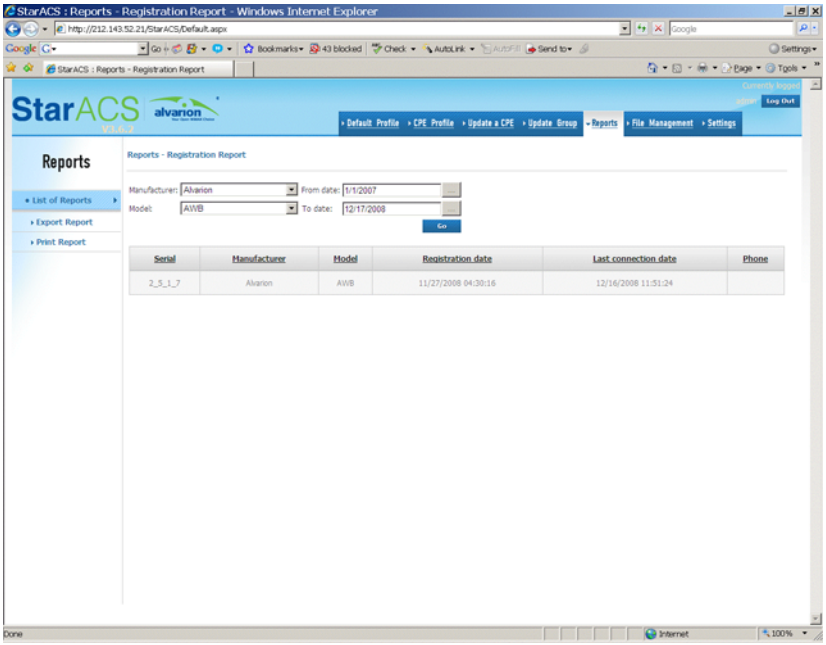

Figure 61: CPE Registration Report

9.3 Pending Tasks Report

Click the Pending Tasks option to display reports of pending tasks by the following parameters:

- Manufacturer
- Model
- From date

A task may be pending for the following reasons:

- The task was configured to be executed at next time reconnection
- The CPE device is not online (The connection between the ACS and the CPE device is broken).

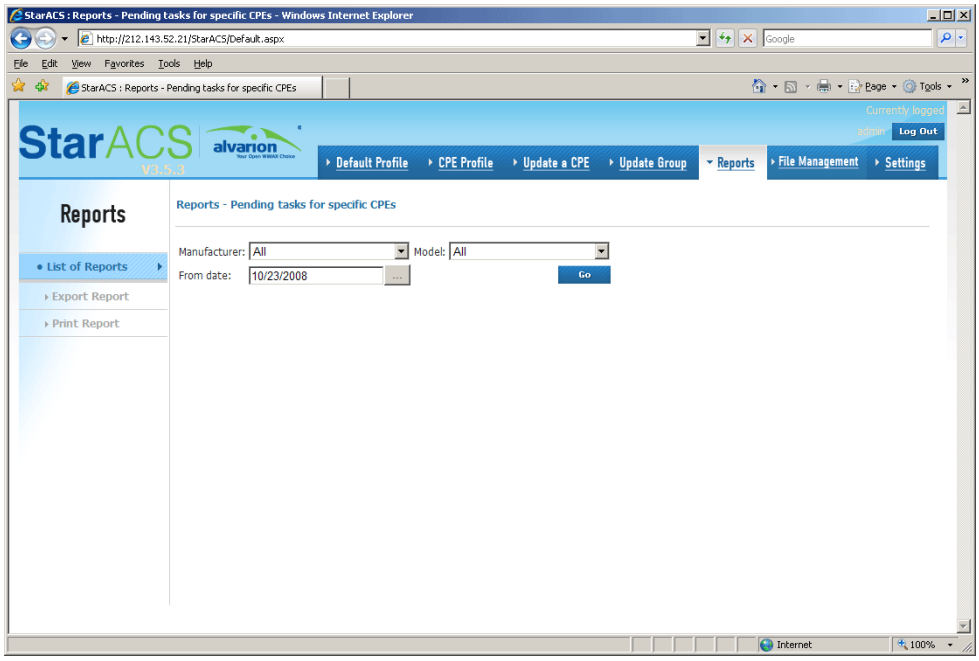

Figure 62: Pending Tasks Window

Select the Manufacturer, Model, and From date and click Go. The Pending Tasks table is displayed.

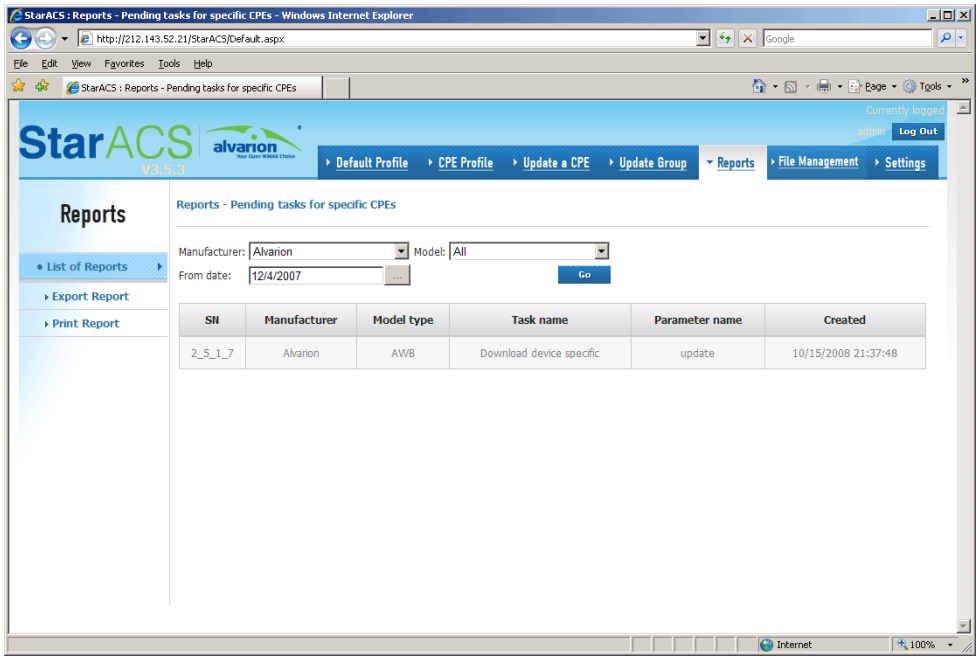

Figure 63: Pending Tasks Table

9.4 Rejected Tasks Report

Rejected task is no response from the CPE on a task, whereas in failed task – the CPE response about this task is “failed”.

Click the Rejected Tasks option to display reports of rejected tasks by the following parameters:

- Manufacturer
- Model Type
- From date

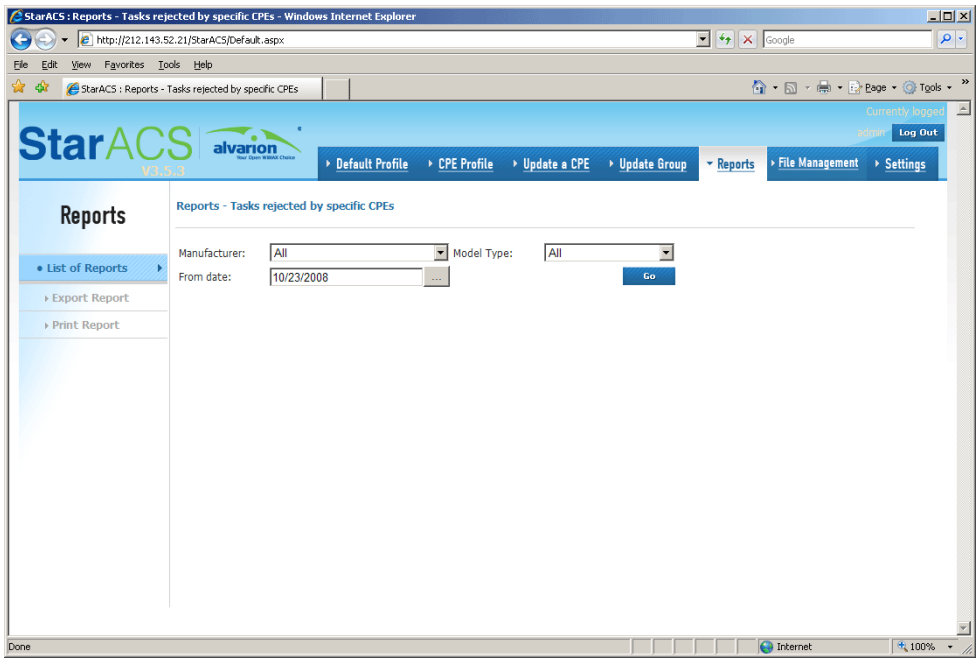

Figure 64: Rejected Tasks Window

Select the Manufacturer, Model, and From date and click Go. The Rejected Tasks table is displayed.

9.5 Activity

Click the Activity option to display activity log reports. The following page is displayed:

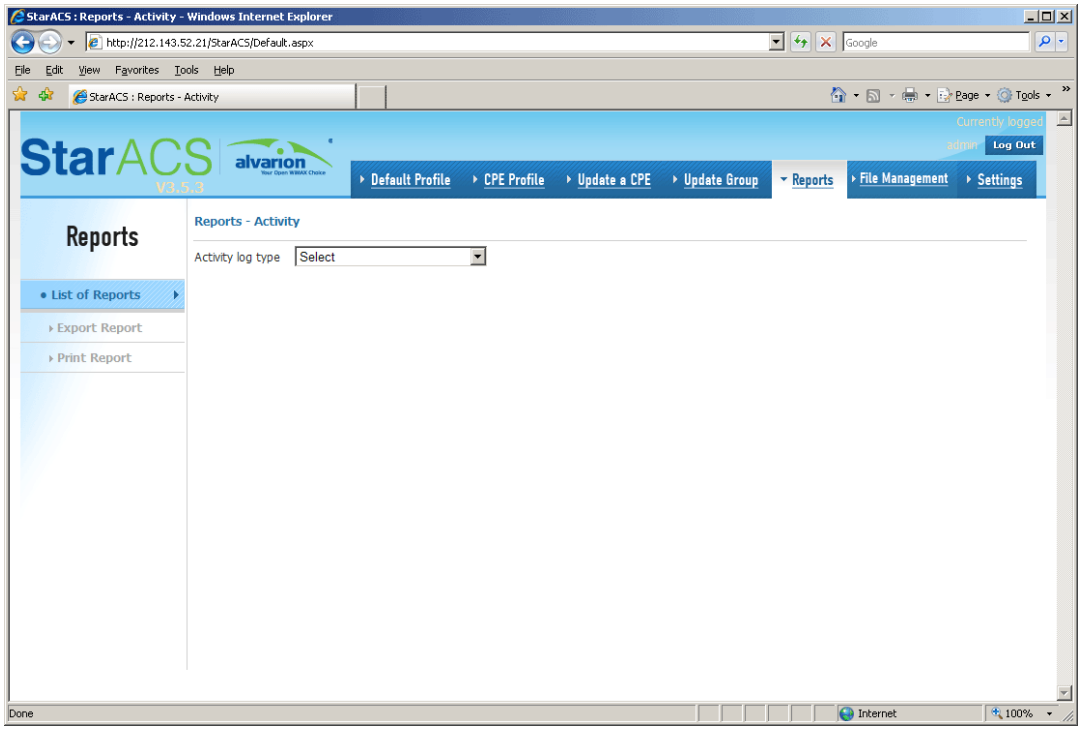

Figure 65: Activity Report Window

Activity reports are displayed by the following activity types:

- Profiles
- Update a CPE
- Update Group
- System

9.5.1 Profiles Activity Report

The activity report lists all the activities that were performed on profiles, such as : create, activate, delete, edit a CPE profile or the default profile.

To display profile activity:

1 Select Profiles from the Activity log type list. The following page is displayed.

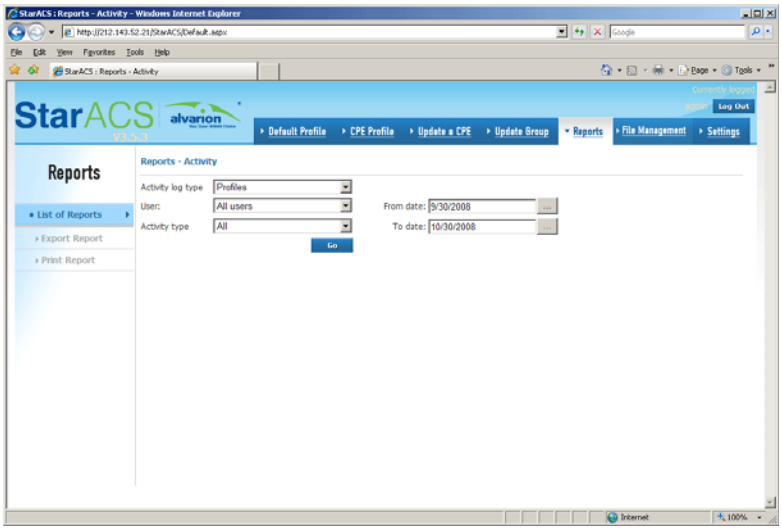

Figure 66: Profiles Window

2 Select the specific user or All users.

3 Select the Activity type. The possible values are All, Create profile, Delete profile, Edit profile, Import profile, Activate profile, Add firmware, and Delete firmware.

4 Select the report date range in From date and To date.

5 Click Go. The Profiles activity report is displayed.

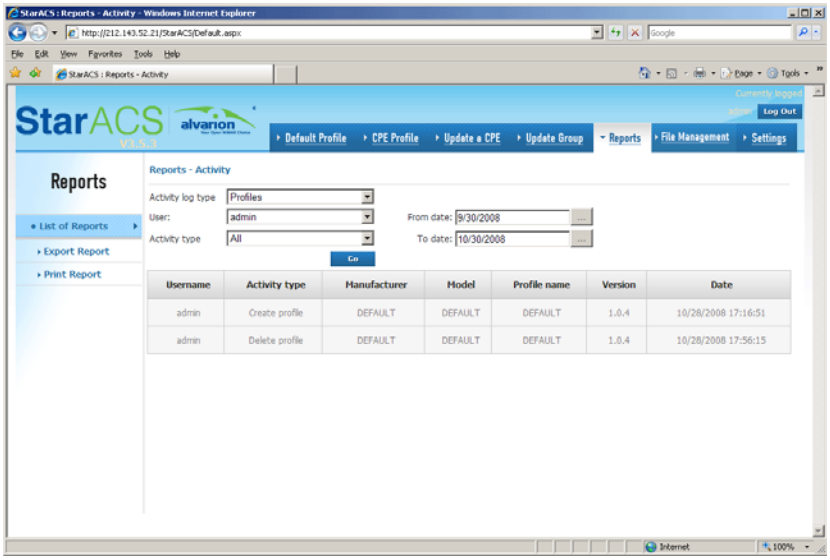

Figure 67: Profiles Activity Report

9.5.2 Update a CPE Activity Report

To display CPE update activity:

1 Select Update a CPE from the Activity log type list. The following page is displayed

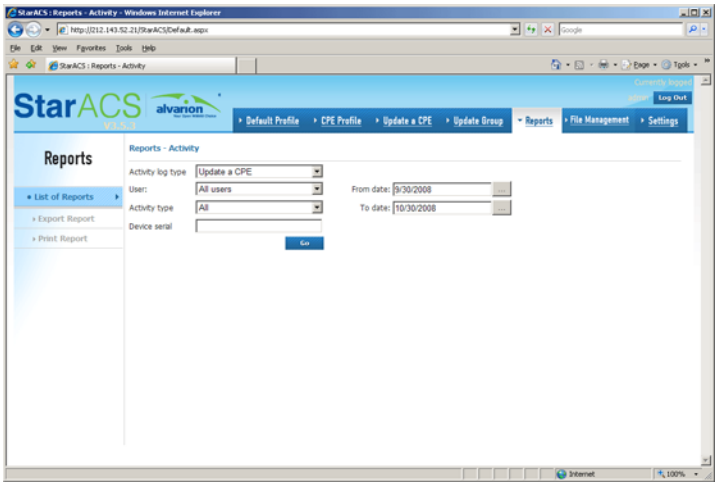

Figure 68: CPE Update Activity Log

2 Select the specific user or All users.

3 Select the Activity type. The possible values are All, Reset to factory default, Reboot device, Delete device, Change parameters, Polling add, Polling remove, Add firmware, Delete firmware, Add object, Delete object, Add file upload, Delete file upload, Add diagnostic, and Delete diagnostic.

4 Select the report date range in From date and To date.

5 To list results for a specific device, enter the device serial number. Otherwise, leave blank.

6 Click Go. The CPE Update activity report is displayed.

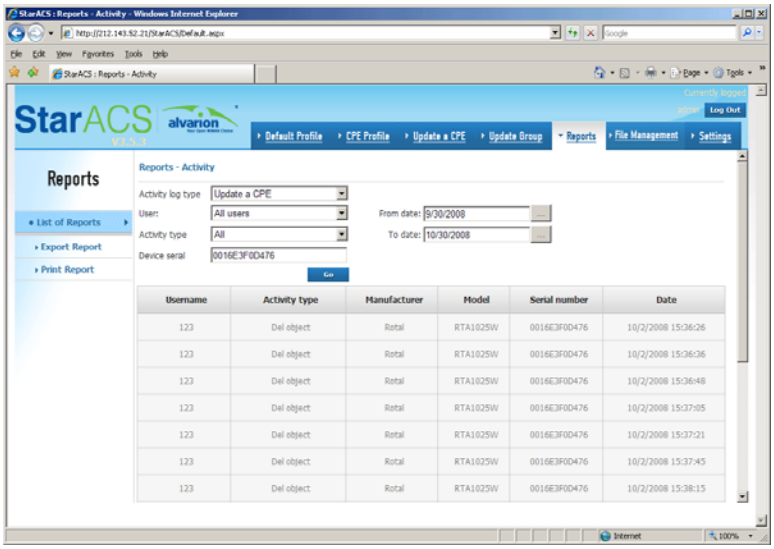

Figure 69: CPE Update Activity Report

9.5.3 Update Group Activity Report

To display CPE Group update activity:

1 Select Update Group from the Activity log type list. The following page is displayed

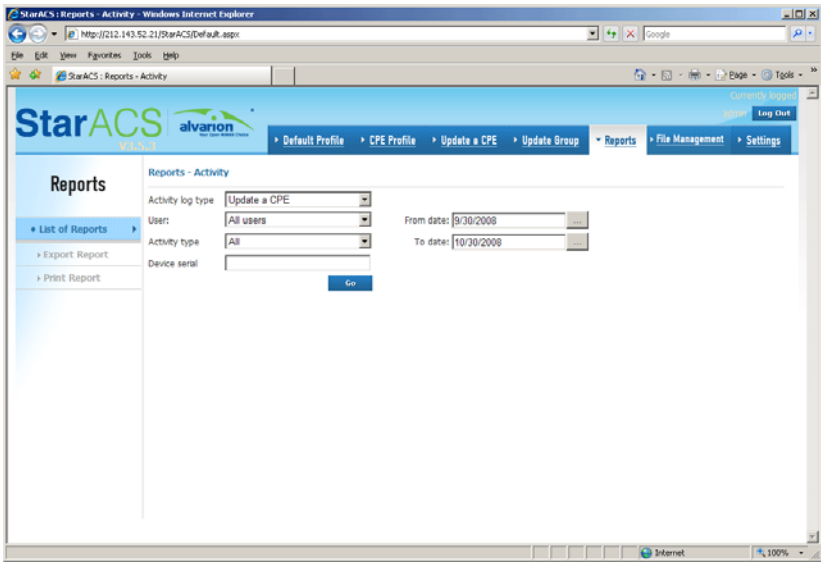

Figure 70: CPE Group Update Activity Log

2 Select the specific user or All users.

3 Select the Activity type. The possible values are All, Create update, Delete update, Edit update, Import update, Activate update, Scheduled activate, Add firmware, EditFirmware, and Delete firmware.

4 Select the report date range in From date and To date.

5 To list results for a specific device, enter the device serial number. Otherwise, leave blank.

6 Click Go. The CPE Group Update activity report is displayed.

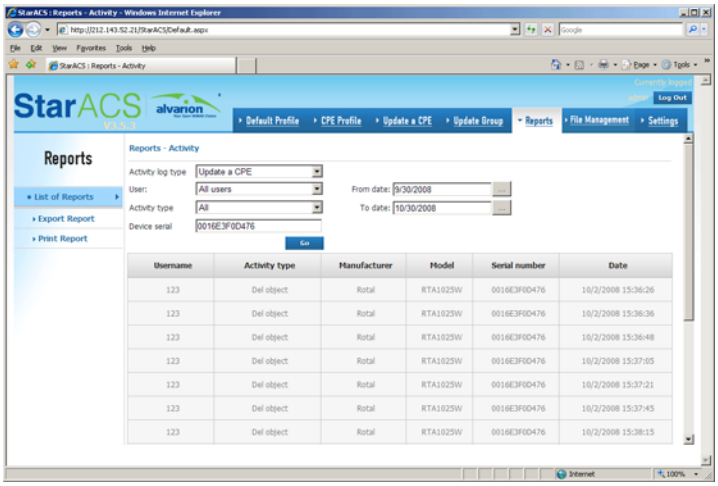

Figure 71: CPE Group Update Activity Report

9.5.4 System Activity Report

To display System activity:

1 Select System from the Activity log type list. The following page is displayed

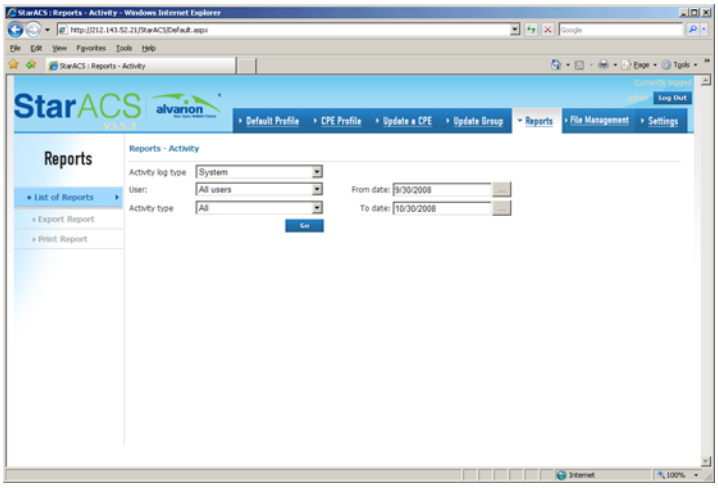

Figure 72: System Activity Log

2 Select the specific user or All users.

3 Select the Activity type. The possible values are All, User login, User logout, Configuring email, Configuring DB, Configuring alert, Create user, Delete user, and Edit user.

4 Select the report date range in From date and To date.

5 Click Go. The System activity report is displayed.

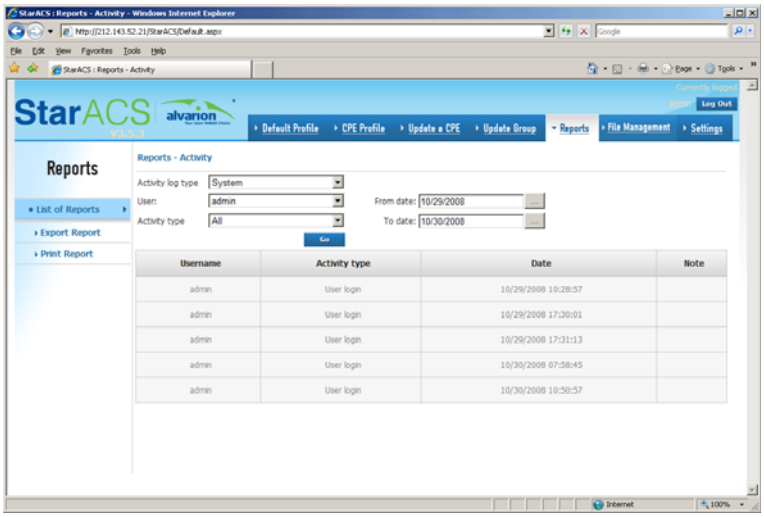

Figure 73: System Activity Report

9.6 Updates Report

Click the Updates Report option to display reports of updating tasks by the following parameters:

- Manufacturer
- Model
- All dates
- Specific Date

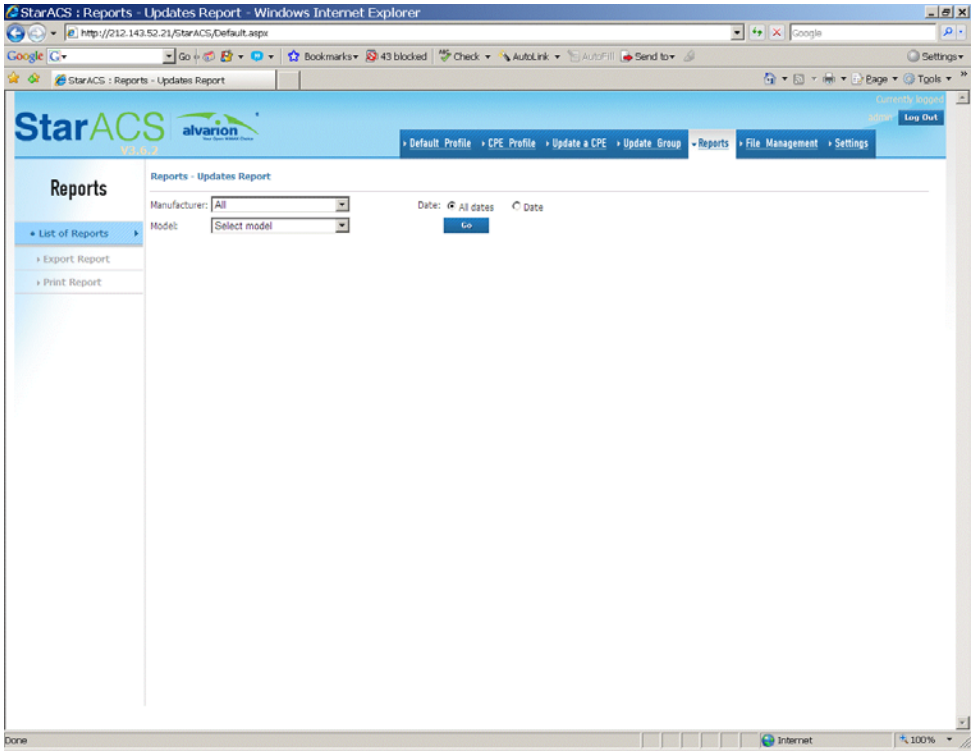

Figure 74: Updates Window

Select the Manufacturer, Model, All Dates or a specific date and click Go. The Updates table is displayed.

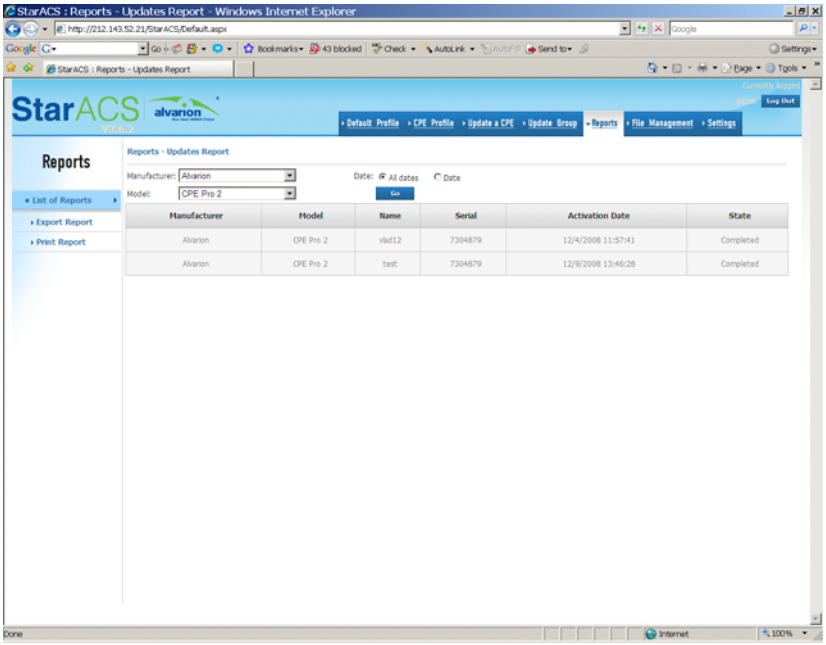

Figure 75: Updates Report

10. File Management

In the File Management window you can view managed files or add files. The settings of the file FTP server are set in the Settings window (see "File Server Settings" on page 26).

Click the File Management tab to display the following menu options:

- File Management
- Add

10.1 File Management

Click the File Management menu option to display a table of managed files:

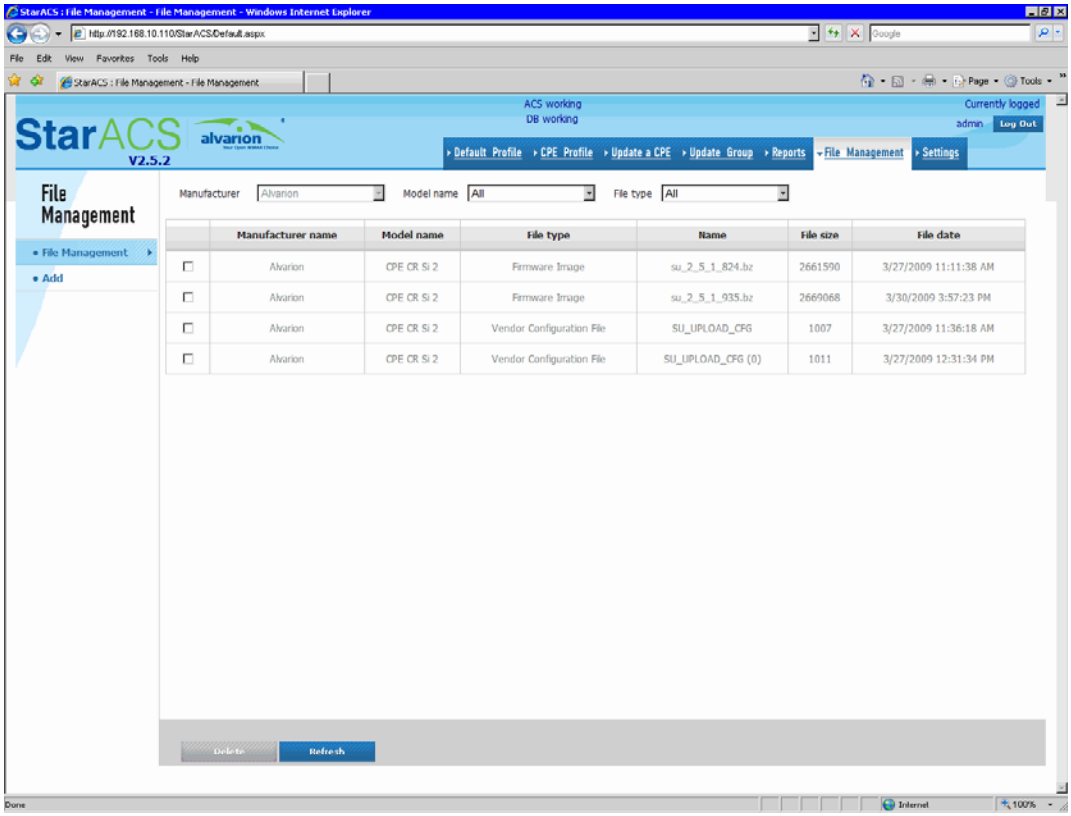

Figure 76: File Management Window

The following fields are available for management:

- Manufacturer
- Model name
- File type - the possible values are All, Firmware Image, and Vendor Configuration File

The table displays the following fields:

- Manufacturer name
- Model name
- File type
- Name

- File size
- File date

The following controls are available:

- Delete - deletes the selected file
- Refresh - refreshes the display

10.2 Adding a File to the Database

Click the Add menu option to add a file to the managed files:

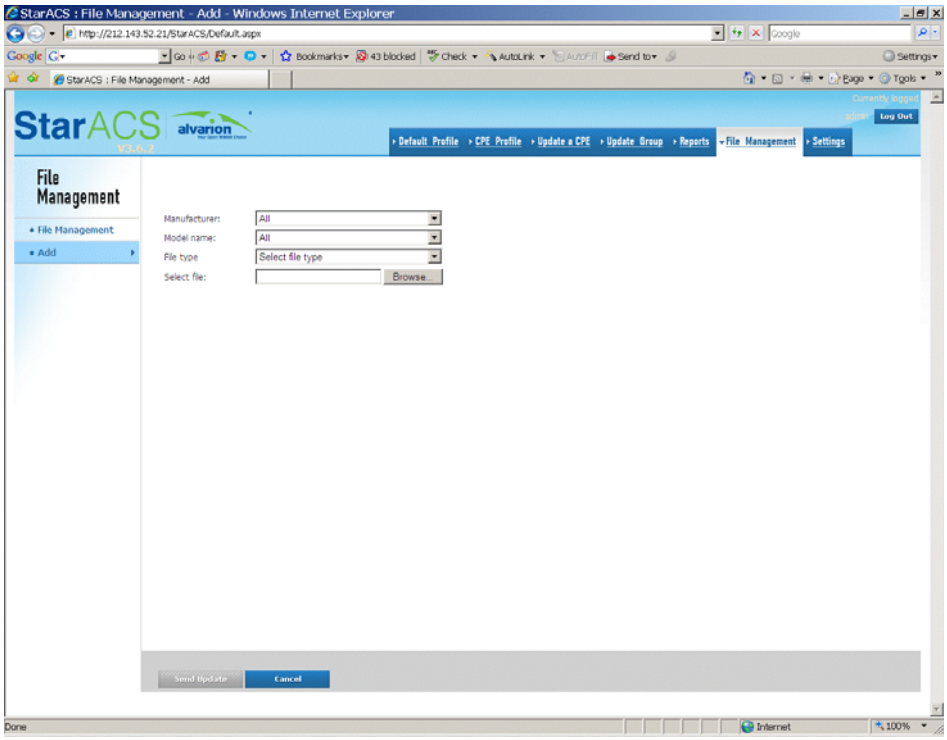

Figure 77: Add File

The following fields are available:

- Manufacturer
- Model name

- File type - the possible values are Firmware Image, Web content, and Vendor Configuration File
- Select file - the file name to add

The following controls are available:

- Send Update - updates the managed files with the selected file
- Cancel - cancels the selected file from the managed files

To add a file to the managed files:

1. Select the file type.
2. Enter the name of the file or click Browse and select it.
3. Click Send Update. The file is added to the managed files.

11. CSR

CSR is a StarACS dependent application, operating with the StarACS database and resources but with a separate security system. This application enables the customer service representative (CSR) to manage, monitor, and diagnose customer premises equipment (CPE) complying with the TR-069 protocol.

Depending on security level, the customer service representative can perform the following tasks:

- Diagnose and configure CPEs
- Update the firmware version
- Upload files from the CPE
- Verify the CPE's connectivity status
- Reset/Reboot the CPE
- Displaythe CPE's activity log
- Perform CPE specific RPC Methods

- Manage CSR users
- Operate with Reports
- Configure the database, upload/download file servers, alerts, email

11.1 Configuration

To configure CSR:

1. Verify that Windows IIS is installed on the computer from which CRS will run.
2. Copy the CSR folder to the IIS root location (by default C:\Inetpub\wwwroot).
3. Assign full permission for the user Everyone to the CSR folder (see Figure 78) if required by the security settings of the operating system.

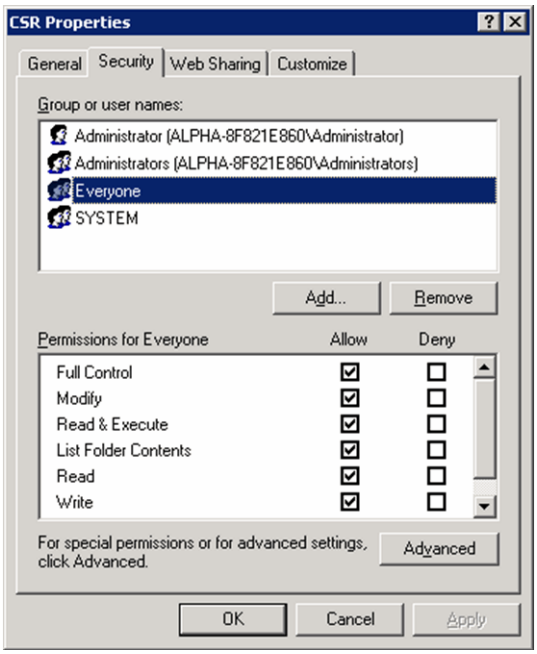

Figure 78: Folder Permissions

4. Open a web browser, enter the link to the CSR application (http://ip_address/CSR/Default.aspx) and press Enter. The login window is displayed.

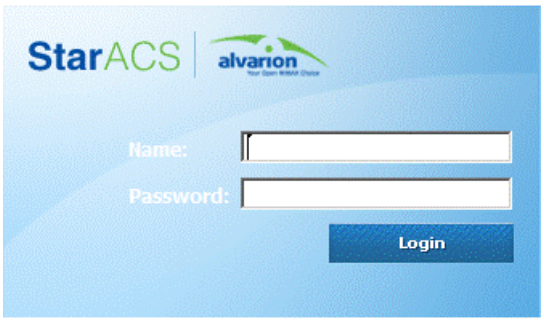

Figure 79: Login WIndow

5 Enter the user name and password (default name and password:admin/admin) and press Enter or click Login. The Update CPE window is displayed.

6 From the Settings tab, select the ACS and DB menu option to configure the connection to the StarACS application (Figure 80). Once the database connection has been correctly configured, the devices from StarACS can be reached from Update a CPE menu. The devices can be managed, depending on the permission assigned to the user.

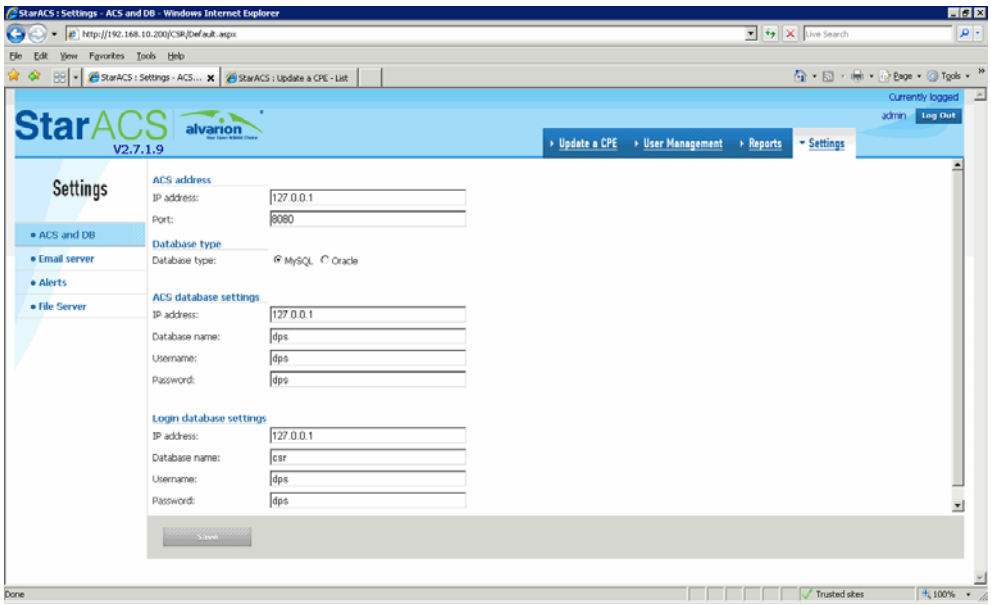

Figure 80: Settings Window

11.2 User Management

CSR defines three levels of user access to the StarACS resources; admin, csr and user. Users can be added and/or configured from the User Management menu by a user with admin permission only.

To add a new user:

- From the User Management tab, click Add and enter the parameters for the user (Figure 81).

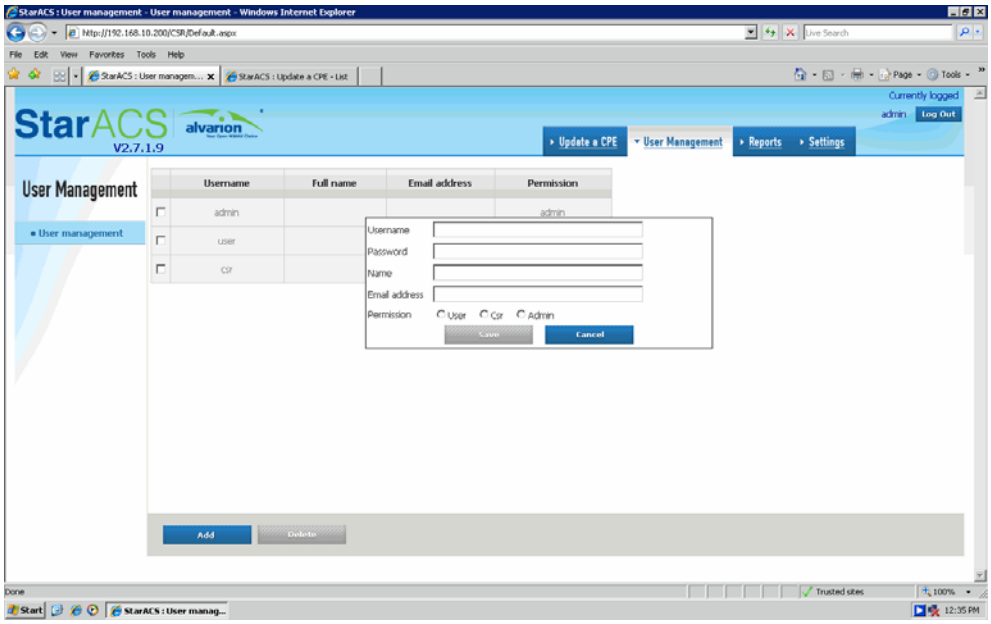

Figure 81: User Management Window

To modify user settings:

- Select the user from the list in the User Management window and modify the parameters as required.

11.2.1 Admin Access Level

Users with admin permission for the CSR application are different from StarACS admin users. This section refers to CSR users only.

Users with admin privileges have the rights to access the following main menus:

- **Update a CPE** - the same full access as StarACS (see "Updating a CPE" on page 39)
- **User Management** - this applies to the CSR only
- **Reports** - See "Reports" on page 76. The CSR application only has access to a limited number of reports.
- **Settings** - See "Defining StarACS Settings" on page 16. or operating with Settings menu please check the section of this manual that explains it. The CSR application only has access to a limited number of settings.

11.2.2 Csr Access Level

Users with Csr permission have the rights to access the following main menus:

- **Update a CPE** - the same full access as StarACS (see "Updating a CPE" on page 39)

11.2.3 User Access Level

Users with User permission have the rights to access the following main menus:

- **Update a CPE** - limited access. Access is Read Only and View Filters are not available.

12. Default Profile Parameters

See also "Defining a CPE Default Profile" on page 27

Table 9: Default Profile Parameters - PRO CPE and Si CPE

Parameter Name	Description	Range	Default
NMS User Name	User name used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol. This user name is used only for HTTP-based authentication of the CPE.	N/A The user name and password should be registered as ACS users	tr069

Table 9: Default Profile Parameters - PRO CPE and Si CPE (Continued)

Parameter Name	Description	Range	Default
NMS Password	Password used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol. This password is used only for HTTP-based authentication of the CPE. When read, this parameter returns an empty string, regardless of the actual value.	N/A	tr069
Keep Alive Enable	Whether or not the CPE maintains a keep alive mechanism.	Yes/No	1=Yes (checkbox selected)
Keep Alive Interval	The duration in seconds of the interval to wait before reaching a decision that the server is no longer available.	N/A	
Connection Request User Name	User name used to authenticate an ACS making a connection request to the CPE	N/A	dps
Connection Request Password	Password used to authenticate an ACS making a Connection Request to the CPE. When read, this parameter returns an empty string, regardless of the actual value.	N/A	dps

13. Device Dependent Parameters and File Transfer Configurations

13.1 BreezeMAX 1000 CPEs

The following are the parameters and file transfer configurations for Alvarion's WiMAX 802.16e PRO and Si CPEs based on the Rosedale 2 chip.

13.1.1 File Transfer Configurations

- Firmware Download:
  The required parameter for firmware download is:
  URL in the format tftp://ip_addr/version.bz, for example:
  tftp://192.168.10.200/su_2_5_1_1015.bz

- Configuration File Download:
  The required parameter for firmware download is:
  URL in the format tftp://ip_addr/config_file, for example:
  tftp://192.168.10.200/ SU_PARAMS_2_5_1_1015.xml

- Configuration File Upload:
  The required parameter for firmware download is:
  URL in the format tftp://ip_addr/config_file, for example:
  tftp://192.168.10.200/ SU_PARAMS_2_5_1_1015.xml

When operating with File Management, the File Servers: Download server details and CPE upload server details must be configured with tftp://ip_addr, for example: tftp://192.168.10.200.

13.1.2 List of Parameters

Table 10: Device Info

Parameter Name	Description	Type	Range	Default
Manufacturer	The manufacturer of the CPE	String of up to 64 characters		Alvarion
Info Model Name	A string identifying the particular CPE model and version	String of up to 64 characters	CPE Pro 2, CPE Pro 2L, CPE Si 2	
Product Variant	Radio Type. A string identifying the particular CPE model and version	String of up to 64 characters	[2X|3X|5X]	

Table 10: Device Info (Continued)

Parameter Name	Description	Type	Range	Default
Description	A full description of the CPE device	String of up to 256 characters	Alvarion WiMax <ProductClass> <ModelName> <ProductVariant>	
Product Class	Product Class of the CPE	String of up to 64 characters	BMAX	Not Set Yet
Serial Number	Serial number of the CPE	String of up to 64 characters		12345678
Hardware Version	Hardware version number	String of up to 64 characters		
Software Version	The software version currently running	String of up to 32 characters	x.x.x.x	
Up Time	Time in seconds since the CPE was last restarted	unsignedInt	0 - 4294967295 Sec	
Name	A full description of the CPE device	String of up to 256 characters.		Not Set Yet
Organization	The name of the organization to which the CPE belongs	String of up to 32 characters.		Not Set Yet
Address	The organization's address	String of up to 32 characters.		Not Set Yet
Country	The country where the organization is located	String of up to 32 characters.		
Manufacturer OUI	Organizationally unique identifier of the device manufacturer. Represented as a six hexadecimal-digit value using all upper-case letters and including any leading zeros. The value MUST be a valid OUI	String of up to 64 characters		0020D6

Table 10: Device Info (Continued)

Parameter Name	Description	Type	Range	Default
Spec Version	Represents the version of the specification implemented by the device	String of up to 16 characters	1.0	
Shadow Indication			0 - The CPE run Main version 1- The CPE run Shadow version	
Configuration was Changed	Informs whether the CPE TR-069 parameters have been altered internally and not by ACS		0 - False 1 - True	
SmartCard Status	SIM card status	unsignedInt	0 - Installed 1 - Not Installed 2 - Failed	
Vendor Config File.i				
Configuration File Name	Name of the vendor configuration file according to the name of the downloaded file	String of up to 64 characters.	e.g. SU16e_2_0_6_76.xml	
Configuration File Version	A string identifying the configuration file version currently used in the CPE Version - Major.Minor.	String of up to 16 characters.	x.x.x.x	
Configuration File Date	Date and time when the content of the current version of this vendor configuration file was first applied by the CPE	DateTime	YYYY-MM-DDTHH:MM:SS	

Table 10: Device Info (Continued)

Parameter Name	Description	Type	Range	Default
Configuration File Description	A description of the vendor configuration file from XML file	String of up to 256 characters.		
Main SW File				
Main SW File Name	Name of the main software file	String of up to 64 characters.	e.g. SU16e_2_0_6_76.bz	
Version of Main SW	A string identifying the main software file version currently used in the CPE	String of up to 16 characters.	x.x.x.x	
Main SW File Date	Date and time when the content of the current version of this main software file file was first applied by the CPE	String of up to 40 characters	e.g. Mon Feb 11 10:04:38 2008	
Shadow SW File				
Shadow SW File Name	Name of the shadow software file.	String of up to 64 characters.	e.g. SU16e_2_0_6_76.bz	
Version of Shadow SW	A string identifying the shadow software file version currently used in the CPE	String of up to 16 characters.	x.x.x.x	
Shadow SW File Date	Date and time when the content of the current version of this shadow software file was first applied by the CPE	String of up to 40 characters.	e.g. Mon Feb 11 10:04:38 2008	

Table 11: Management Server

Parameter Name	Description	Type	Range	Default
NMS User Name	The Username used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol (used only for HTTP-based authentication).	String of up to 256 characters.		tr069
NMS User Password	The Password used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol (used only for HTTP-based authentication).	String of up to 256 characters.		tr069
Periodic Inform Enable	Enables to set whether or not the CPE must periodically send CPE information to the Server using the Inform method call.	Boolean	0 - Disable 1 - Enabled	1
Periodic Inform Interval	The duration in seconds of the interval for which the CPE must attempt to connect with the ACS and call the Inform method. Functional only if the Periodic Inform Enable parameter is enabled (checked).	unsignedInt		86400

Table 11: Management Server (Continued)

Parameter Name	Description	Type	Range	Default
Periodic Inform Time	An absolute time reference in UTC to determine when the CPE should initiate the Inform method calls. Each Inform call must occur at this reference time plus or minus an integer multiple of the Periodic Inform Interval. This parameter will be read only and set to zero dateTime value (0000-00-00T00:00:00) indicates that no particular time reference is specified. That is, the CPE may locally choose the time reference, required only to adhere to the specified PeriodicInformInterval.	DateTime	YYYY-MM-DDTHH:MM:SS	0000-00-00T00:00:0
Parameter Key	The value of the ParameterKey argument from the most recent Set Parameter Values, Add Object, or Delete Object method call from the Server. If there have been no such calls, this value is empty	String of up to 32 characters.		

Table 11: Management Server (Continued)

Parameter Name	Description	Type	Range	Default
Connection request URL	HTTP URL for an ACS to make a Connection Request notification to the CPE,in the form: http://host:port/path The “host” portion of the URL MAY be the IP address for the management interface of the CPE in lieu of a host name.	String of up to 256 characters.		http://Management_IP_addr_of_CPE:8082/MAC_address_of_cpe
Connection Request Username	Username used to authenticate an ACS making a Connection Request to the CPE.	String of up to 256 characters.		Alvaristar
Connection Request Password	The password used to authenticate an ACS making a Connection Request to the CPE.	String of up to 256 characters.		Alvaristar
Upgrades Managed	Indicates whether or not the ACS will manage upgrades for the CPE. If true (1), the CPE SHOULD not use other means other than the ACS to seek out available upgrades. If false (0), the CPE MAY use other means for this purpose.	Boolean	1 - True 0 - False	0
Network Time	Specifies whether the CPE succeeded or failed to synchronize to the local clock used for loging events with the network	Boolean	0 - Not available 1 - Available	

Table 11: Management Server (Continued)

Parameter Name	Description	Type	Range	Default
URL	URL for the CPE to connect to the ACS using the CPE WAN Management Protocol. This parameter MUST be in the form of a valid HTTP. The “host” portion of this URL is used by the CPE for validating the certificate from the ACS when using certificate-based authentication.	String of up to 256 characters.	ASCII representation of the following text: http://aaa.bbb.ccc.ddd/nnn	

Table 12: Services

Parameter Name	Description	Range	Default
Services			
Actual Service Mode	Determines whether the CPE will act in IP CS or L2 CS	0 - IP 1 - L2 CS	
Configured Service Mode)	Determines whether the CPE will act in IP CS or L2 CS. The change in settings of this parameter takes effect only after reset.	0 - IP CS 1 - L2 CS	0 - IP CS
IP CS			
VLAN to DSCP Number of Entries	Number of instances of VLAN to IPCS rules (active and inactive rules) To add an instance: 1 Click "Add object" control button to add a new instance of VLAN to DSCP. The "Active" field should be set to 0 (not active). 2 Send a message with the values for the fields in the newly created object. 3 Set the "Active" field to 1 (active). This will cause the all the fields of the object to become 'Read-Only'. To inactivate or remove an instance click the "Delete object" control button. To update an object, delete the existing object and add a new object.	0 - 7	

Table 12: Services (Continued)

Parameter Name	Description	Range	Default
VLAN to DSCP.i			
Active	This is a read only field and is managed by "Add Object" and "Delete Object"	0 - Not active 1 - Active	1
In VLAN ID	This is a read only field and is managed by "Add Object" and "Delete Object"	0 - 4095	3
In VLAN Priority	This is a read only field and the number is managed by "Add Object" and "Delete Object"	0 - 7	0
Out DSCP Start	On UL, in case start=stop and marking is enabled, all packets that match the vlan defined for the rule will have their DSCP replaced with outDSCPstart/stop. On DL, In case start=stop and marking is enabled and learnedDSCP is initialized, the matched packet will have its DSCP restored. In case start != stop or marking is disabled or learnedDSCP is not initialized, the matched packet will not have its DSCP restored. In both cases, the matched packets will have Vlan added. This is a read only field is managed by "Add Object" and "Delete Object"	0 - 63	21

Table 12: Services (Continued)

Parameter Name	Description	Range	Default
Out DSCP End	On UL, in case start=end and marking is enabled, all packets that match the vlan defined for the rule will have their DSCP replaced with outDSCPstart/stop. On DL, In case start=end and marking is enabled and InDSCP is initialized, the matched packet will have its DSCP restored. In case start != stop or marking is disabled or learnedDSCP is not initialized, the matched packet will not have its DSCP restored. In both cases, the matched packets will have Vlan added. This is a read only field and is managed by "Add Object" and "Delete Object"	outDSCPstart - 63	21
DSCP ReMarking Enabled	This is a read only field and is managed by "Add Object" and "Delete Object".	0 - False 1 - True	1

Table 12: Services (Continued)

Parameter Name	Description	Range	Default
L2 CS			
DSCP to VLAN Number of Entries	Number of instances of VLAN to L2 CS rules (active and inactive rules) To add an instance: 1 Click "Add object" control button to add a new instance of DSCP to VLAN. The "Active" field should be set to 0 (not active). 2 Send a message with the values for the fields in the newly created object. 3 Set the "Active" field to 1 (active). This will cause the all the fields of the object to become 'Read-Only'. To inactivate or remove an instance click the "Delete object" control button. To update an object, delete the existing object and add a new object.		
DSCP to VLAN			
Active	This is a read only field and is managed by “Add Object” and “Delete Object”	0 - Not Active 1 - Active	1

Table 12: Services (Continued)

Parameter Name	Description	Range	Default
DSCP Start	On UL, in case start=stop and marking is enabled, all packets that match the vlan defined for the rule will have their DSCP replaced with outDSCPstart/stop. On DL, In case start=stop and marking is enabled and learnedDSCP is initialized, the matched packet will have its DSCPrestored. In case start != stop ormarking is disabled or learnedDSCP is not initialized, the matched packet will not have its DSCP restored. In both cases, the matched packets will have Vlan added. This is a read only field is managed by “Add Object” and “Delete Object”	0 - 63	

Table 12: Services (Continued)

Parameter Name	Description	Range	Default
DCSCP Stop	On UL, in case start=end and marking is enabled, all packets that match the vlan defined for the rule will have their DSCP replaced with outDSCPstart/stop. On DL, In case start=end and marking is enabled and InDSCP is initialized, the matched packet will have its DSCP restored. In case start != stop or marking is disabled or learnedDSCP is not initialized, the matched packet will not have its DSCP restored. In both cases, the matched packets will have Vlan added. This is a read only field and is managed by “Add Object” and “Delete Object”	0 - 64	
Out VLAN ID	This is a read only field and is managed by “Add Object” and “Delete Object”	0 - 4095	NA
Out VLAN Priority	This is a read only field and the number is managed by “Add Object” and “Delete Object”	0 - 8	0
Management			
Actual DSCP Marking	DSCP value used in Uplink direction for all management traffic (including DHCP sessions)	0 - 63	

Table 12: Services (Continued)

Parameter Name	Description	Range	Default
Configured DSCP Marking	The configured DSCP value used in Uplink for all management traffic (including DHCP sessions). The entered value will become the actual value after reset.	0 - 63	6

Table 13: WAN Device

Parameter Name	Description	Range	Default
NDS			
Antenna Selection Control	Enables to select the antenna to be used.	0- External 1-6 Internal (front & rear) 7- Auto	7- Auto
Mobility Mode	Enables/disables fast mobility.	0 - Fixed / Nomadic 1 - Mobile	0 - Fixed / Nomadic
NDS Parameters			
BaseStationSelection			
Allowed BS ID	The currently configured BS ID that is allowed to communicate with the SU		186.190.0.0.250.206
Allowed BS ID Mask	The currently configured BS ID mask that is allowed to communicate with the SU		00:00:00:00:00:00
Preffered BS ID	The currently configured BS ID that together with the Preferred BS ID Mask define the initial search range for the best BS.		186.190.0.0.250.206
Preffered BS ID Mask	The currently configured BS ID Mask that together with the Preferred BS ID define the initial search range for the best BS.		00:00:00:00:00:00

Table 13: WAN Device (Continued)

Parameter Name	Description	Range	Default
Configured Allowed BS ID	Defines the BS ID used together with the BS ID Mask to define the range of BSs that can communicate with the SU.	6 groups of up to 3 digits each. Each group range is 0-255.	186.190.0.0.250.206
Configured Allowed BS ID Mask	Defines the BS ID Mask used together with the BS ID to define the range of BSs that can communicate with the SU.	6 groups of up to 3 digits each. Each group range is 0-255.	0.0.0.0.0.0
Configured Preffered BS ID	The BS ID that together with the Preferred BS ID Mask define the initial search range for the best BS. The SU will select the best BS within this range. If no BS is found within this range, the SU will continue searching in the entire range defined by the BS ID and BS ID Mask parameters.	6 groups of up to 3 digits each. Each group range is 0-255.	186.190.0.0.250.206
Configured Preffered BS ID Mask	The BS ID Mask that together with the Preferred BS ID define the initial search range for the best BS.	6 groups of up to 3 digits each. Each group range is 0-255.	0.0.0.0.0.0
Scanning.1			
Scan Bandwidth	The scanning frequency currently configured	2 - 5 Mhz 3 - 7 Mhz 5 - 10 Mhz 6 - Auto	6 - Auto
Start Frequency	The lowest frequency currently configured	See Table 14	Default values according to the 2.x or 3.x
Stop Frequency	The highest frequency currently configured	See Table 14	Default values according to the 2.x or 3.x
Main Frequency Step	The main frequency step currently configured		

Table 13: WAN Device (Continued)

Parameter Name	Description	Range	Default
Intermediate Frequency Step	The intermediate frequency steps currently configured		
Configured Scan Bandwidth	Specifies the scanning frequency that shall become the actual value after reset.	2 - 5 MHz; 3 - 7 MHz; 5 - 10 MHz; 6 - Auto	6 - Auto
Configured Start Frequency	The lowest frequency in the range of frequencies to be scanned (in MHz)	Depends on the radio band of the unit. See Table 14	Default values according to the 2.x or 3.x
Configured Stop Frequency	The highest frequency in the range of frequencies to be scanned (in MHz).	Depends on the radio band of the unit. See Table 14	Default values according to the 2.x or 3.x
Configured Main Frequency Step	The Main Scanning Step that together with the Intermediate Scanning Steps define the frequencies to be scanned between the Start and End Rx Frequencies.	5 MHz and 10 MHz: 125 KHz - 5000 KHz 7 MHz: 125 KHz - 1750 KHz	5 MHz and 10 MHz: 2500 KHz 7 MHz: 875 KHz
Configured Intermediate Frequency Step	8 steps that define the frequencies to be scanned between the Start and End Rx Frequencies	Depends on CPE frequency, see Table 14	Default values according to the 2.x or 3.x
Discrete List Number of Entries	Specifies the current number of discrete frequencies. This is a read only field and the number is managed by "Add Object" and "Delete Object"	0 - 10	
Discrete List.i			
Frequency	A discrete frequency (in kHz)	A valid frequency.	
Status			
Serving Base Station ID	The BS ID of the base station currently serving the CPE		

Table 13: WAN Device (Continued)

Parameter Name	Description	Range	Default
Authentication Method	The authentication method in use	0 - Not authenticated 1 - EAP TLS (future use) 2 - EAP TTLS 3 - EAP AKA (future use)	
Configured Authentication Method	Select the authentication method to be used	0 - Not authenticated 1 - EAP TLS (future use) 2 - EAP TTLS 3 - EAP AKA (future use)	
Channel Frequency	The frequency (in kHz) that the CPE is tuned in on		
Transmit Power	The current transmit power [dbm] of the CPE		
Bandwidth	The bandwidth currently in use.	0- 5MHz 1- 7MHz 2- 10MHzy	
Selected Antenna	The current antenna selected.	1-7 Auto	
Downlink SNR	The SNR of the CPE	(-100) - (+100)	0
Downlink RSSI	The RSSI of the CPE	(-115) - (+50)	0

Table 13: WAN Device (Continued)

Parameter Name	Description	Range	Default
Max Uplink Rate	The maximum UL rate in the last 100 frames interval (There is no sliding window)	QPSK_1_2 rep 6 QPSK_1_2 rep 4 QPSK_1_2 rep 2 QPSK_1_2 QPSK_3_4 16QAM_1_2 16QAM_3_4 64QAM_1_2 64QAM_2_3 64QAM_3_4 64QAM_5_6	Not Set Yet
Max Downlink Rate	The maximum DL rate in the last 100 frames interval (There is no sliding window)	QPSK_1_2 rep 6 QPSK_1_2 rep 4 QPSK_1_2 rep 2 QPSK_1_2 QPSK_3_4 16QAM_1_2 16QAM_3_4 64QAM_1_2 64QAM_2_3 64QAM_3_4 64QAM_5_6	Not Set Yet
DistanceTo BS	The distance of the MS from the BS in meters. This value should be calculated based on the initial range response timing offset and should consider periodic offset correction.	0 - 100000 (meters)	0

Table 13: WAN Device (Continued)

Parameter Name	Description	Range	Default
Total Bytes Sent	The total number of bytes sent over the interface since the CPE was last reset.		
Total Bytes Received	The total number of bytes received over the interface since the CPE was last reset.		
Total Packets Sent	The total number of packets sent over the interface since the CPE was last reset.		
Total Packets Received	The total number of packets received over the interface since the CPE was last reset.		
Scanned BS ID Number Of Entries	The number of the BS in the best AU table (a table listing all the base stations in reach of the CPE)	0 - 40	0

Table 14: Radio Types

HW type - Radio type	Frequency range	Power range (Max/Min)
	To retrieve center frequency add/subtract half bandwidth from bottom/top frequency	
2.3GHz ADC	2300000-2360000KHz	ODU:19/-26dBm
		IDU:23/-26dBm
2.5GHz ADC	2496000-2690000KHz	ODU:19/-26dBm
		IDU:24/-26dBm
5.2GHz ADC	5150000-5350000KHz	ODU: 18/-26dBm
3.3GHz SMI (0.8)	3300000-3400000KHz	ODU:20/-26dBm
		IDU:22/-26dBm
3.5GHz SMI (0.8)	3399500-3600000KHz	ODU:20/-26dBm
		IDU:22/-26dBm

Table 14: Radio Types (Continued)

HW type - Radio type	Frequency range	Power range (Max/Min)
3.6GHz SMI (0.8)	3600000-3800000KHz	ODU:20/-26dBm
		IDU:22/-26dBm
2.XGHz SMI (1.0)	2300000-2700000KHz	All IDU:
	Sub-Range 2.3GHz:	For 2.3GHz Sub-Range:
	2300000-2360000KHz	
	Sub-Range 2.5GHz:	For 2.5GHz Sub-Range:
	2496000-2690000KHz	24/-26dBm
3.XGHz SMI (1.0)	3300000-3800000KHz	All IDU:
		23/-26dBm.

Table 15: LAN Devices

Parameter Name	Description	Range	Default
LAN Ethernet Interface Config.1			
MAC Address	The physical address of the interface		
MAC Address Control Number	The MAC address control number		
Ethernet Actual Port Mode	Ethernet Port Mode	Link Down Full / 10 Full / 100 Half / 10 Halfl / 100	Link Down
Configured Port Mode	Enables to configure the Ethernet port to auto-negotiation mode or to set the duplex and speed.	0 = 10 Mbps Half Duplex 1 = 10 Mbps Full Duplex 2 = 100 Mbps Half Duplex 3 = 100 Mbps Full Duplex 4 = Auto	4 - Auto

Table 15: LAN Devices (Continued)

Parameter Name	Description	Range	Default
WAN Up LAN Short Down	Enable/Disables the Ethernet phy after wireless link is established (to cause the host to send DHCP discover)	0 - Disabled 1 - Enabled	1
Statistics			
Bytes Sent	Total number of bytes sent over the interface since the CPE was last reset		
Bytes Received	Total number of bytes received over the interface since the CPE was last reset		
Packets Sent	Total number of packets sent over the interface since the CPE was last reset		
Packets Received	Total number of packets received over the interface since the CPE was last reset		
LAN Host Config Management			
IP Interface.1.			
IP Address	IP Address for local Web provisioning		192.168.254.251
Subnet Mask	Subnet mask for IP Address of local Web provisioning		255.255.255.0

Table 16: Authentication

Parameter Name	Description	Range	Default
Domain Name	Default Domain Name used in TTLS for wimax authentication.	A string	WiMAX.com
Configured Domain Name	Configured Default Domain Name used in TTLS for wimax authentication. Becomes the actual value after reset	Any string	WiMAX.com
Username	CPE username used in TTLS for wimax authentication.	A string	MAC_address
Configured Username	Configured user name used in TTLS for wimax authentication.Becomes the actual value after reset.	Any string	MAC_address
Configured Password	User password used in TTLS for wimax authentication. Becomes the actual value after reset.	Any string	quickynikynyoky

Table 17: Configure File Format Version

Parameter Name	Description	Range	Default
Major Ver	Major Version No. (Ignore if VendorConfigFile table exists.)	unsignedInt	1
Minor Ver	Minor Version No. (Ignore if VendorConfigFile table exists.)	unsignedInt	0

13.2 BreezeMAX 5000 CPE

The following are the parameters and file transfer configurations for Alvarion's WiMAX 802.16e PRO CPEs based on the Sequans chip.

13.2.1 File Transfer Configurations

- Firmware Download
  The required parameters for firmware download are:
  URL in the format ip_addr, for example: 192.168.10.21
  Target Location that is the file_name, for example: K2_4_6_5_54.bz
  File Size in bytes, for example: 4520625

- Configuration File Download
  The required parameters for firmware download are:
  URL in the format ip_addr, for example: 192.168.10.21
  Target Location that is the file_name, for example: configuration.xml
  File Size in bytes, for example: 5000

- Configuration File Upload
  The required parameter for firmware download is:
  URL in the format ip_addr, for example: 192.168.10.21

When operating with File Management, the File Servers: Download server details and CPE upload server details must be configured with an ip_addr, for example 192.168.10.21.

Sequans CPEs do not require the name of the protocol in the URL but the supported protocol is tftp.

13.2.2 List of Parameters

Table 18: Device Info

Parameter Name	Description	Type	Range	Default
Operator Profile Number Of Entries	The number of entries in the Operator Profile table	unsignedInt		
Description	A full description of the CPE device	String of up to 256 characters	Alvarion WiMax <ModelName> <ProductVariant>	
Hardware Version	Hardware version number	String of up to 64 characters		
Manufacturer	The manufacturer of the CPE	String of up to 64 characters		Alvarion
Manufacturer OUI	Organizationally unique identifier of the device manufacturer. Represented as a six hexadecimal-digit value using all upper-case letters and including any leading zeros. The value MUST be a valid OUI	String of up to 64 characters		0020D6
Info Model Name	A string identifying the particular CPE model and version	String of up to 64 characters	CPE PRO SQ, CPE PRO SQ-L, CPE Si SQ, CPE Si SQ-L	
Product Class	Product Class of the CPE	String of up to 64 characters		Sequans
Serial Number	Serial number of the CPE	String of up to 64 characters		
Software Version	Firmware version number	String of up to 64 characters		
Up Time	Time in seconds since the CPE was last restarted	unsignedInt	>0	0

Table 18: Device Info (Continued)

Parameter Name	Description	Type	Range	Default
Product Variant	Radio Type. A string identifying the particular CPE model and version	String of up to 64 characters	[2X|3X|5X]	
Smart Card	SIM card status	unsignedInt	0 - Installed 1 - Not Installed 2 - Failed	
Vendor Config File				
Configuration File Date	Date and time when the content of the current version of this vendor configuration file was first applied by the CPE	DateTime	YYYY-MM-DDTHH:MM:SS	0001-01-01T00:00:00
Configuration File Description	A description of the vendor configuration file from XML file	String of up to 256 characters.		
Configuration File Name	Name of the vendor configuration file according to the name of the downloaded file	String of up to 64 characters.		family.xml
Configuration File Version	A string identifying the configuration file version currently used in the CPE	String of up to 16 characters.		1
Config File MD5 Signature	MD5 signature of the file	String of up to 16 characters.		No File Yet
Main SW File				
Main SW File Name	Name of the main software file	String of up to 64 characters.	K2_x_y_z_t.app	
Version of Main SW	A string identifying the main software file version currently used in the CPE	String of up to 16 characters.	x.y.z.t	

Table 18: Device Info (Continued)

Parameter Name	Description	Type	Range	Default
Main SW File Date	Date and time when the content of the current version of this main software file file was first applied by the CPE	DateTime		
Shadow SW File				
Shadow SW File Date	Date and time when the content of the current version of this shadow software file was first applied by the CPE	DateTime		
Shadow SW File Name	Name of the shadow software file.	String of up to 64 characters.	K2_x_y_z_w.app	
Vendor Config File Number of Entries	Defines the number of vendor configuration file entries	unsignedInt	0 - 1	1
Version of Shadow SW	A string identifying the shadow software file version currently used in the CPE	String of up to 16 characters.	x.y.z.w	
File Transfer Mode		String of up to 16 characters.	0 - Single file transfer at a time 1 - Single file transfer per direction at a time 2 - Multuiple files transfer simultaneously	1 - Single file transfer per direction at a time
File Transfer Protocol		String of up to 16 characters.	1 - TFTP 2 - FTP 3 - HTTP	1 - TFTP
Running SW	Current software running	Boolean	0 - Main 1 - Shadow	0

Table 19: WiMAX Device Info

Parameter Name	Description	Type	Range	Default
Terminal Equipment				
Manufacturer	The manufacturer of the CPE	String of up to 50 characters		Alvarion
Model	A string identifying the particular CPE model and version	String of up to 50 characters	CPE PRO SQ, CPE PRO SQ-L, CPE Si SQ, CPE Si SQ-L	
Hardware Version	Hardware version number	String of up to 50 characters		
Device Identifier	The device identifier of the Terminal Equipment. The value of this parameter MUST be unique and formatted as a URN as defined in [RFC2141]. The value MUST be the concatenation of: 1.) Manufacturer 2.) Equipment model number - in this case the concatenation of: - DeviceInfo.ProductClass - One Space character (" ") - DeviceInfo.ModelName 3.) Serial number The elements are separated by a ":". For example: "urn: Alvarion:Rosedale2 CPE PRO2:12345678" Related to the device identifier defined within the TR-069 protocol (the DeviceID argument of the Inform message).	String of up to 50 characters	See the Range definitions of the following parameters: - Manufacturer - ProductClass - ModelName - SerialNumber	Factory

Table 19: WiMAX Device Info

Parameter Name	Description	Type	Range	Default
Device Type	Defines the type of device. Enumeration of: Laptop, PMP, MultiModePMP, UMPC, InternetTablet, GamingDev, Digital Camera, Digital Camcorder, MultiModeMsgDev, EBook, NavigationDev, InVehicleEntDev, CPE.	String of up to 50 characters	CPE	CPE
Firmware Version	The firmware version of the terminal equipment. FirmwareVersion is a string of dot-delimited integers. FirmwareVersion holds the version number of the currently running version (i.e. Active SW Version).	String of up to 50 characters		
OS Name	the name of the operating system running on the CPE.			

Table 20: Management Server

Parameter Name	Description	Type	Range	Default
Username	The user name used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol (used only for HTTP-based authentication).	String of up to 256 characters.		tr069
Password	The Password used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol (used only for HTTP-based authentication).	String of up to 256 characters.		tr069

Table 20: Management Server (Continued)

Parameter Name	Description	Type	Range	Default
Connection Request URL	The CPE defines a URL with the format of the Default URL . The "host" portion may be the IP address of the NMS interface of the CPE or a host name.	String of up to 256 characters.	http://host:port/RemoteCPEManager	
Connection Request Username	Username used to authenticate an NMS making a Connection Request to the CPE.	String of up to 256 characters.		Alvaristar
Connection Request Password	Password used to authenticate an NMS making a Connection Request to the CPE. When read returns an empty string regardless of actual value.	String of up to 256 characters.		Alvaristar

Table 20: Management Server (Continued)

Parameter Name	Description	Type	Range	Default
Parameter Key	ParameterKey provides the NMS with a reliable and extensible means to track changes made by the NMS. The value of ParameterKey MUST be equal to the value of the ParameterKey argument from the most recent successful reception of any of the following methods: - SetParameterValues - AddObject - DeleteObject The ParameterKey will be reset to zero when a Factory Reset is executed.			
DSCP	The actual DSCP value in to be used in the management connection	unsignedInt	0 - 63	6
Organization	The name of the organization to which the CPE belongs	String of up to 32 characters.		Not set yet
Address	The organization's address	String of up to 32 characters.		Not set yet
Country	The country where the organization is located	String of up to 32 characters.		Not set yet
Periodic Inform Enable	Enables to set whether or not the CPE maintains a keep alive mechanism.	Boolean	Yes/No	1=Yes (checkbox selected)

Table 20: Management Server (Continued)

Parameter Name	Description	Type	Range	Default
Periodic Inform Interval	The duration in seconds of the interval to wait before reaching a decision that the server is no loner available. Functional only if the Enable parameter is enabled (checked).	unsignedInt		86400
Periodic Inform Time	An absolute time reference in UTC to determine when the CPE first initiates the keep alive mechanism.	DateTime	YYYY-MM-DDTHH:MM:SS	0000-00-00T00:00:0 0
Default DSCP	Default DSCP value	unsignedInt	0 - 63	6
Actual DSCP	Actual DSCP value	unsignedInt	0 -63	6
URL	URL for the CPE to connect to the ACS using the CPE WAN Management Protocol. This parameter MUST be in the form of a valid HTTP. The “host” portion of this URL is used by the CPE for validating the certificate from the ACS when using certificate-based authentication.	String of up to 256 characters.	ASCII representation of the following text: http://aaa.bbb.ccc .ddd/nnn	
Upgrades Managed	Indicates whether the ACS will manage upgrades for the CPE. If true the CPE should only use ACS to search for available upgrades. If false the CPE may use other means for this purpose.	Boolean	0 - False 1 - True	0 - False

Table 21: Local Management

Parameter Name	Description	Type	Range	Default
Installer Password	Password for direct access to the CPE	String of up to 32 characters.		installer

Table 22: Services

Parameter Name	Description	Range	Default
Services			
CS Type	The operation mode describing the method of connection of the CPE	0 - IP CS 1 - L2 CS	0
IP CS			
IP CS Rules Number of Entries	Defines the number of IP CS rules	Read: 1 - 8 Write: 2 - 8	8
Service Rule.i			
Active	Configures whether VLAN parameters are active or not	0 - Not active 1 - Active	0
Incoming VLAN ID	ID of incoming VLAN	0 - 4095	0
Incoming VLAN Priority	Priority of incoming VLAN	0 - 7	0
Incoming DSCP		0 - False 1 - True	0
Enable DSCP Remarking	Configures whether DSCP remarking is enabled.	0 - False 1 - True	0

Table 22: Services (Continued)

Parameter Name	Description	Range	Default
Outgoing DSCP - Start of Range	On UL, in case start=stop and marking is enabled, all packets that match the vlan defined for the rule will have their DSCP replaced with outDSCPstart/stop. On DL, In case start=stop and marking is enabled and learnedDSCP is initialized, the matched packet will have its DSCP restored. In case start != stop or marking is disabled or learnedDSCP is not initialized, the matched packet will not have its DSCP restored. In both cases, the matched packets will have Vlan added. This is a read only field is managed by "Add Object" and "Delete Object"	0 - 63	0

Table 22: Services (Continued)

Parameter Name	Description	Range	Default
Outgoing DSCP - End of Range	On UL, in case start=end and marking is enabled, all packets that match the vlan defined for the rule will have their DSCP replaced with outDSCPstart/stop. On DL, In case start=end and marking is enabled and InDSCP is initialized, the matched packet will have its DSCP restored. In case start != stop or marking is disabled or learnedDSCP is not initialized, the matched packet will not have its DSCP restored. In both cases, the matched packets will have Vlan added. This is a read only field and is managed by "Add Object" and "Delete Object"	outDSCPstart - 63	0

Table 23: LAN Device

Parameter Name	Description	Range	Default
LAN Device			
Lan Device.i			
LAN Ethernet Interface Config.i			
Enable		0 - Disable 1 - Enable	0 - Disable
MACAddress	The MAC address of the LAN port.		
Status	The status of the LAN port.		

Table 23: LAN Device

Parameter Name	Description	Range	Default
Configured Port Mode	Enables to configure the Ethernet port to auto-negotiation mode or to set the duplex and speed.	0 = 10 Mbps Half Duplex 1 = 10 Mbps Full Duplex 2 = 100 Mbps Half Duplex 3 = 100 Mbps Full Duplex 4 = Auto	4 - Auto
Actual Port Mode	Actual Ethernet port mode	10 Mbps Half Duplex, 10 Mbps Full Duplex, 100 Mbps Half Duplex, 100 Mbps Full Duplex	
LAN Disable when WAN is Down		0 - Disabled 1 - Enabled	
Short LAN Down when WAN is Up	Enable/Disables the Ethernet phy after wireless link is established (to cause the host to send DHCP discover)	0 - Disabled 1 - Enabled	1
Stats			
Stats.i			
Total Bytes Sent	Total number of bytes sent over the LAN port since the CPE was last reset		0
Total Bytes received	Total number of bytes received over the LAN port since the CPE was last reset		0
Total Packets Sent	Total number of packets sent over the LAN port since the CPE was last reset		0

Table 23: LAN Device

Parameter Name	Description	Range	Default
Total Packets Received	Total number of packets received over the LAN port since the CPE was last reset		0
Receive Bit Rate	The received bit rate of the LAN port		0
Receive Packet Rate	The received packet rate of the LAN port		0
Transmit Bit Rate	The transmitted bit rate of the LAN port		0
Transmit Packet Rate	The transmitted packet rate of the LAN port		0
Hosts			
Number of hosts	Number of hosts		0
Host.i			
MAC Address	The physical address of the host		
LAN Host Config Management			
IP Interface Number of Entries	Defines the number of IP interface entries		1
IP Interface.i			
IP Address LAN Side	IP Address for local Web provisioning		192.168.254.251
Subnet Mask	Subnet mask for IP Address of local Web provisioning		255.255.255.0
IP Addressing Method	Select the type of IP addressing	Static Dynamic DHCP	Static

Table 24: WAN Device

Parameter Name	Description	Range	Default
WAN Device			
WAN Device.i			
ATPC			
ATPC Enable	Enable/Disable the ATPC algorithm	0 - Disable 1 - Enable	
Tx Power	Describes the transmission power level		
WAN Common Interface Config			
WAN Access Type	Type of WAN Access	WiMAX	WiMAX
Total Bytes Transmitted	Total number of bytes sent over the WAN port since the CPE was last reset		0
Total Bytes Received	Total number of bytes received over the WAN port since the CPE was last reset		0
Total Packets Transmitted	Total number of packets sent over the WAN port since the CPE was last reset		0
Total Packets Received	Total number of packets received over the WAN port since the CPE was last reset		0
Current Bit Received Rate	The received bit rate of the WAN port		0
Current Packet Received Rate	The received packet rate of the WAN port		0
Current Bit Transmitted Rate	The transmitted bit rate of the WAN port		0
Current Packet Transmitted	The transmitted packet rate of the WAN port		0

Table 24: WAN Device (Continued)

Parameter Name	Description	Range	Default
WiMAX Interface Quality			
CINR	Carrier to Interference-plus-Noise Ratio expressed in decibels (dBs)		
CINR Reuse 1	Carrier to Interference-plus-Noise Ratio for schema Reuse 1		
CINR Reuse 3	Carrier to Interference-plus-Noise Ratio for schema Reuse 3		
CINR Std	Standard deviation of CINR		
CINR Std Reuse 1	Standard deviation of CINR for schema Reuse 1		
CINR Std Reuse 3	Standard deviation of CINR for schema Reuse 3		
Current FEC Code	Forward error correction code in use		
Last TX Power	The last detected transmission rate		
RSSI	The RSSI of the CPE		
RSSI Std	Standard deviation of RSSI		
Uplink FEC code	Uplink forward error correction code		
WiMAX Interface Status			
Authentication Method	Select the type of authentication method in use	0 - None 1 - EAP TLS 2 - EAP TTLS 3 - EAP AKA 4 - PLAIN-MSCHAPV2	2 - EAP TTLS
Transmit Power	The current transmit power [dbm] of the CPE		

Table 24: WAN Device (Continued)

Parameter Name	Description	Range	Default
Channel Frequency	The frequency (in kHz) that the CPE is tuned in on.		
Bandwidth	The bandwidth currently in use.	3.5 MHz 5 MHz 7 MHz 10 MHz Optional 20 MHz Auto	Auto
Selected Antenna	The current antenna selected.	1 - 6	
Downlink SNR	The SNR of the CPE	0 - 3500	
Maximum Downlink rate	The maximum DL rate in the last 100 frames interval (There is no sliding window)	QPSK_1_2 rep 6 QPSK_1_2 rep 4 QPSK_1_2 rep 2 QPSK_1_2 QPSK_3_4 16QAM_1_2 16QAM_3_4 64QAM_1_2 64QAM_2_3 64QAM_3_4 64QAM_5_6	

Table 24: WAN Device (Continued)

Parameter Name	Description	Range	Default
Maximum Uplink Rate	The maximum UL rate in the last 100 frames interval (There is no sliding window)	QPSK_1_2 rep 6 QPSK_1_2 rep 4 QPSK_1_2 rep 2 QPSK_1_2 QPSK_3_4 16QAM_1_2 16QAM_3_4 64QAM_1_2 64QAM_2_3 64QAM_5_6	
Distance to BS	The distance of the MS from the BS in meters. This value should be calculated based on the initial range response timing offset and should consider periodic offset correction		
WiMAX Interface Config			
Radio Module			
Radio Model	Select the type of radio model.	WiNetworks SMI 1.0 SMI DUAL SMI 0.7 new SMI 0.7 SMI 0.5 ADC	
Frequency Band Name	Name of the radio band that is used		
Frequency Band Start	The frequency at which to start scanning, in MHz	2305 to 5150	
Frequency Band End	The frequency at which to stop scanning, in MHz	2360 to 5350	

Table 24: WAN Device (Continued)

Parameter Name	Description	Range	Default
Radio Link Control			
Mobility Mode	Mobility type of the CPE	Fixed Mobile Nomadic	Fixed

Table 25: WiMAX Operator Profile

Parameter Name	Description	Range	Default
WiMAX Operator Profile.i			
Subscription Parameters			
EAP Profile Number of Entries	Defines the number of EAP profiles		
EAP Profile.i			
Type	Select the authentication method to be used	EAP-TLS EAP-TTLS EAP-AKA PLAIN-MSCHAPV2 Not Authenticated	EAP-TTLS
Identity	Defines the identity within the selected protocol	String of up to 253 characters	<Empty>
Shared Secret	Defines the password used within the selected protocol	String of up to 253 characters	
Realm	Defines the override realm that is sent in the EAP identity response packet. The identity response is:USERNAME@REALM	String of up to 256 characters	
Server Realm List	A list of comma separated allowed realms that the device MUST accept for the subjectAltNamesNSName file in the server certificate for the EAP peer	String of up to 251 characters	

Table 25: WiMAX Operator Profile

Parameter Name	Description	Range	Default
Disable Frequency Scan (DFS)	Enables/Disables Frequency Scan	0 - Disable 1- Enable	0
Primary			
Activated	Indicates the provisioning status of the primary subscriber.	0 - False 1 - True	0
Name	The name of the subscriber		
EAP Profiles	A comma separated list of EAP profile object instance numbers to be used for the client authentication of the associated connection device.	String of up to 256 characters	
WiMAX Network Parameters			
Channel Plan Number of Entries	Defines the number of channel plan entries	0 - 1	0
BS Scanning Results Number of Entries	Defines the number of BS scanning results entries	0 - 40	0
Discrete Frequencies Number of Entries	Defines the number of discrete frequencies entries	0 - 10	1
Channel Scanning Results.i			
BS ID	The BS ID of the base station currently serving the CPE		
SNR	The SNR of the CPE (in dB)		
Frequency	The frequency (in kHz) that the CPE is tuned in on		
Bandwidth	The bandwidth currently in use (in MHz)		

Table 25: WiMAX Operator Profile

Parameter Name	Description	Range	Default
Channel Plan.i			
Scanning Band - Low End	The bandwidth at which to start scanning, in kHz	125KHz resolution for 2.x and 3.x GHz and 2.5MHz resolution for 5.xGHz	Band start frequency
Scanning Band - High End	The bandwidth at which to end scanning, in kHz	125KHz resolution for 2.x and 3.x GHz and 2.5MHz resolution for 5.xGHz	Band stop frequency
Frequency Main Step	The main frequency step currently configured. (Applicable only for 2.xGHz and 3.xGHz)	Step of 125KHz resolution for 2.x and 3.xGHz, and 2.5Mhz for 5.xGHz	2.5MHz for BWs of n*5MHz, 1.75MHz for BWs n*3.5MHz.
Frequency Intermediate Step	The intermediate frequency steps currently configured	1 - First freq scan, 2- 125KHz, 3- 250KHz, 4- 375KHz, 5- 500KHz, 6 - 625KHz, 7 - 750KHz, 8 - 1250KHz for BW=2.5MHz*n / 875KHz for BW=1.75MHz*n	
Scan All Frequencies	Scanning of all band sizes is allowed.	0 - False 1 - True	1
Scan Bandwidth	The scanning frequency currently configured	0 1	

Table 25: WiMAX Operator Profile

Parameter Name	Description	Range	Default
Discrete Frequencies.i			
Active	Used for devices that implement a static table of discrete frequencies for scanning. Set to 1 (true) when the service rule is added (AddObject). Set to 0 (false) when the service rule is deleted (DeleteObject).	0 - False 1 - True	
Frequency	A discrete frequency (in kHz)	A valid frequency	
BS Selection			
Allowed BS ID	The currently configured BSID that is allowed to communicate with the SU	0 =< Ni =< 255	0.0.0.0.0.0
Allowed BS ID Mask	The currently configured BS ID mask that is allowed to communicate with the SU	1 =< Ni =< 255	0.0.0.0.0.0
Preffered BS ID	The currently configured BS ID that together with the Preferred BS ID Mask define the initial search range for the best BS.	2 =< Ni =< 255	0.0.0.0.0.0
Preffered BS ID Mask	The currently configured BS ID Mask that together with the Preferred BS ID define the initial search range for the best BS.	3 =< Ni =< 255	0.0.0.0.0.0
Serving BS ID	The BS ID of the base station currently serving the CPE	3 =< Ni =< 255	0.0.0.0.0.0

13.3 BreezeMAX 2000 CPEs

The following are the parameters and file transfer configurations for Alvarion's WiMAX 802.16e PRO and Si CPEs based based on the Beceem chip.

13.3.1 File Transfer Configurations

- Firmware Download
  The required parameters for firmware download are:
  URL in the format http://ip_addr/virtual_dir/version.tar.gz, for example:
  http://192.168.10.21/acs/images-Alvarion-1.0.0.21.11-5.2.6_P1.tar.gz
  File Size in bytes, for example 6520625

- Configuration File Download
  The required parameter for firmware download is:
  URL in the format http://ip_addr/virtual_dir/config_file, for example:
  http://192.168.10.21/acs/nv.bin
  File Size in bytes, for example 70000

- Configuration File Upload
  The required parameter for firmware download is:
  URL in the format http://ip_addr/virtual_dir, for example:
  http://192.168.10.21/acs

When operating with File Management, the File Servers: Download server details and CPE upload server details must be configured with http://ip_addr/virtual_dir, for example: http://192.168.10.21/acs

13.3.2 List of Parameters

Table 26: Device Info

Parameter Name	Description	Type	Range	Default
Device Summary	The default value of the parameter on creation of an object instance via TR-069. If the default value is an empty string, this is represented by the symbol <Empty>. A hyphen indicates that no default value is specified. For a parameter in which no default value is specified, on creation of a parent object instance, the CPE MUST set the parameter to a value that is valid according to the definition of that parameter.			
LAN Device number of Entries	Number of instances of LAN Device			
WAN Device number of Entries	Number of instances of WAN Device			
WiMAX Forum Operator number of entries	The number of entries in the Operator Profile table			
Description	A full description of the CPE device	String of up to 256 characters	Alvarion WiMax <ModelName> <ProductVariant>	
Hardware Version	Hardware version number	String of up to 64 characters		
Manufacturer	The manufacturer of the CPE	String of up to 64 characters		Alvarion

Table 26: Device Info (Continued)

Parameter Name	Description	Type	Range	Default
Manufacturer OUI	Organizationally unique identifier of the device manufacturer. Represented as a six hexadecimal-digit value using all upper-case letters and including any leading zeros. The value MUST be a valid OUI	String of up to 64 characters		0020D6
Info Model Name	A string identifying the particular CPE model and version	String of up to 64 characters	CPE PRO SQ, CPE PRO SQ-L, CPE Si SQ, CPE Si SQ-L	
Product Class	Product Class of the CPE	String of up to 64 characters		Sequans
Provisioning Code	Identifier of the primary service provider and other provisioning information, which may be used by the ACS to determine service provider-specific customization and provisioning parameters.			
Serial Number	Serial number of the CPE	String of up to 64 characters		
Software Version	Firmware version number	String of up to 64 characters		
Up Time	Time in seconds since the CPE was last restarted	unsignedInt	>0	0
Vendor Config File Number of Entries	Defines the number of vendor configuration file entries	unsignedInt	0 - 1	1

Table 26: Device Info (Continued)

Parameter Name	Description	Type	Range	Default
File Transfer Protocol		String of up to 16 characters	1 - TFTP 2 - FTP 3 - HTTP	1 - TFTP
Product Variant	Radio Type. A string identifying the particular CPE model and version	String of up to 64 characters	[2X|3X|5X]	
Shadow Indication	Indicates the active software version	Boolean	0 - Main 1 - Shadow	
Smart Card	SIM card status	unsignedInt	0 - Installed 1 - Not Installed 2 - Failed	
Vendor Config File				
Configuration File Date	Date and time when the content of the current version of this vendor configuration file was first applied by the CPE	DateTime	YYYY-MM-DDTHH:MM:SS	0001-01-01T00:00:00
Configuration File Description	A description of the vendor configuration file from XML file	String of up to 256 characters.		
Configuration File Name	Name of the vendor configuration file according to the name of the downloaded file	String of up to 64 characters.		family.xml
Configuration File Version	A string identifying the configuration file version currently used in the CPE	String of up to 16 characters.		1
Config File MD5 Signature	MD5 signature of the file	String of up to 16 characters.		No File Yet
Main SW File				
Main SW File Name	Name of the main software file	String of up to 64 characters.	K2_x_y_z_t.app	

Table 26: Device Info (Continued)

Parameter Name	Description	Type	Range	Default
Version of Main SW	A string identifying the main software file version currently used in the CPE	String of up to 16 characters.	x.y.z.t	
Main SW File Date	Date and time when the content of the current version of this main software file file was first applied by the CPE	DateTime		
Shadow SW File				
Shadow SW File Date	Date and time when the content of the current version of this shadow software file was first applied by the CPE	DateTime		
Shadow SW File Name	Name of the shadow software file.	String of up to 64 characters.	K2_x_y_z_w.app	
Version of Shadow SW	A string identifying the shadow software file version currently used in the CPE	String of up to 16 characters.	x.y.z.w	

Table 27: LAN Device

Parameter Name	Description	Range	Default
LAN Device			
Lan Device.i			
Lan Ethernet Interface Number of Entries	The number of Ethernet ports on the LAN side of the CPE	0 - 8	1
LAN WLAN Configuration Number of Entries	The number of WiFi ports (wireless LAN)on the LAN side of the CPE	0 - 1	1

Table 27: LAN Device

Parameter Name	Description	Range	Default
Hosts			
Host Number of Entries	Number of entries in the host table		0
LAN Ethernet Interface Config.i			
Status	The status of the LAN port		
MAC Address	The physical address of the interface		
Stats			
Bytes Received	Total number of bytes received over the LAN port since the CPE was last reset		
Bytes Sent	Total number of bytes sent over the LAN port since the CPE was last reset		
Packets Received	Total number of packets received over the LAN port since the CPE was last reset		
Packets Sent	Total number of packets sent over the LAN port since the CPE was last reset		
LAN Host Config Management			
DHCP Lease Time	Specifies the lease time (in seconds) of the client assigned to the address	-1 20160 10080 2880 1440 720 120 60 30	

Table 27: LAN Device

Parameter Name	Description	Range	Default
DHCP Server Enable	The DHCP server is enabled/disabled at the CPE	0 - False 1 - True	0
Domain Name	The domain name to give to clients on the LAN interface		
Max Address	The last address in the pool to be assigned by the DHCP server on the LAN interface		
Min Address	The first address in the pool to be assigned by the DHCP server on the LAN interface		
Subnet Mask	The subnet mask of the client's network		255.255.255.0
Management Server			
Connection Request Password	The password used to authenticate an ACS making a Connection Request to the CPE.	String of up to 256 characters.	Alvaristar
Connection Request URL	HTTP URL for an ACS to make a Connection Request notification to the CPE,in the form: http://host:port/path The "host" portion of the URL MAY be the IP address for the management interface of the CPE in lieu of a host name.	String of up to 256 characters.	http://Management_IP_addr_of_CPE:8082/MAC_address_of_cpe
Connection Request User Name	The username used to authenticate an ACS making a Connection Request to the CPE.	String of up to 256 characters.	Alvaristar

Table 27: LAN Device

Parameter Name	Description	Range	Default
Parameter Key	ParameterKey provides the NMS a reliable and extensible means to track changes made by the NMS.	String of up to 32 characters	0
Password	The password used by the CPE to identify itself to the NMS for autherntication and authorization purposes		
Periodic Inform Enable	Whether or not the CPE must periodically send CPE information to Server using the Inform method call.	False True	True
Periodic Inform Interval	The interval (in seconds) when the CPE sens information to the server. The default defines the schedule as once a day.		86400
URL	The URL for the CPE to connect to the NMS		
Username	The username used by the CPE to identify itself to the NMS for authentication and authorization purposes.		
Address	The organization's address	String of up to 32 characters	Not set yet
Configured DSCP	The configures DSCP value to be used in the management connection.	0 - 63	6
Control Number	Used by the CPE to identify itself to the NMS for ongoing authentication of the CPE after the initial connection is completed		
Country	The country where the organization is located	String of up to 32 characters	

Table 27: LAN Device

Parameter Name	Description	Range	Default
Default DSCP	The default DSCP value to be used in the management connection	0 - 63	6
DSCP	The actual DSCP value used in the management connection	0 - 63	6
Organization	The name of the organization to which the CPE belongs	String of up to 32 characters	

Table 28: Services

Parameter Name	Description	Range	Default
Voice Service			
Voice Service.i			
Voice Profile			
Voice Profile.i			
RTP			
DSCP Mark	Diffserv code point to be used for outgoing SIP signalling packets	0 - 63	
SIP			
DSCP Mark	Diffserv code point to be used for outgoing RTP packets for this profile	0 - 63	
Time			
Current Local Time	The current local time. This field must have a value if NTP protocol is supported.	YYYY-MM-DDTHH:MM:SS	
NTP Server1	First NTP timeserver. Either a host name or IP address.		NTP server not found
CPE Time	The date and time of the CPE	YYYY-MM-DDTHH:MM:SS	

Table 28: Services

Parameter Name	Description	Range	Default
NTP Supported	The CPE supports/does not support NTP protocol and timing from the network.	True False	

Table 29: WAN Device

Parameter Name	Description	Range	Default
WAN Device			
WAN Device.i			
WAN connection number of entries	Number of instances of WANConnectionDevice in this WANDevice.		
WAN Common Interface Config			
Physical Link Status	The status of the physical link	Up Down	
Total Bytes Sent	Total number of bytes sent over the WAN port since the CPE was last reset		0
Total Bytes Received	Total number of bytes received over the WAN port since the CPE was last reset		0
Total Packets Sent	Total number of packets sent over the WAN port since the CPE was last reset		0
Total Packets Received	Total number of packets received over the WAN port since the CPE was last reset		0
WAN Access Type	Type of WAN Access	WiMAX	WiMAX
Rx Bit Rate	Current receive rate in bps		0
Tx Bit Rate	Current transmit rate in bps		0

Table 29: WAN Device (Continued)

Parameter Name	Description	Range	Default
Wan Connection Device.i			
WAN IP Connection Number of Entries	Number of WAN IP Connections		1
DataTransfer Mode	Defines whether the CPE is routing or bridging user data.	Router mode Bridge mode	Router mode
VOIP Transfer Mode	Defines whether the CPE is routing or bridging user VOIP.	Router mode Bridge mode	Router mode
Management Transfer Mode	Defines whether the CPE is routing or bridging management data.	Router mode Bridge mode	Router mode
WAN IP Connection.i			
Addressing Type	The parameter is used to assign an address to the WAN side interface of the CPE for this connection.	DHCP Static **Note:** Static option might not be supported	
Connection Status	Current status of the connection	Unconfigured Connecting Connected PendingDisconnect Disconneting Disconnected	Unconfigured
Possible Connection Types	A comma-separated list indicating the types of connections possible for this connection instance. Each element of the list is an enumeration of:Unconfigured, IP_Routed		Unconfigured, IP_Routed

Table 29: WAN Device (Continued)

Parameter Name	Description	Range	Default
External IP Address	This is the external IP address used by NAT for this connection. This parameter is configurable only if the AddressingType is Static.		
Subnet Mask	Subnet mask of the WAN interface. This parameter is configurable only if the AddressingType is Static.		
Default Gateway	The IP address of the default gateway for this connection. This parameter is configurable only if the AddressingType is Static.		
DNS Servers	for this connection. The first address is of the Primary DNS Server and the second is the address of the Secondary DNS Server.		
MAC Address	The MAC Address of the WAN side of the IP Connection. Note: currently the CPE uses the same MAC address for both LAN side and WAN side connections.		
Stats			
Ethernet Bytes Received	The total number of Ethernet bytes received		
Ethernet Bytes Sent	The total number of Ethernet bytes sent		
Ethernet Packets Received	The total number of Ethernet packets received		
Ethernet Packets Sent	The total number of Ethernet packets sent		

Table 29: WAN Device (Continued)

Parameter Name	Description	Range	Default
WiMAX Interface Quality			
Downlink CINR	Downlink CINR rate in decibels (dBs)		
Downlink RSSI	The median level of the signal received by the SU based on 2sec histograms. Aggregated RSSI from both antennas.	20 - 106	
Last Rx Rate	Last received (Rx) bit rate of the WAN port		
Last Tx Rate	Last transmitted (Tx) bit rate of the WAN port		
WiMAX Interface Status			
Transmit Power	The current transmit power [dbm] of the CPE		
Channel Frequency	The frequency (in kHz) that the CPE is tuned in on.		
Bandwidth	The bandwidth currently in use.		Auto
WiMAX Interface Config			
Radio Module			
MAC Address	The MAC address of the WAN side of the CPE		
Model	Describes the radio module in use by the CPE. May have one of the values in the range	WiNetworks SMI 1.0 SMI DUAL SMI 0.7 new SMI 0.7 SMI 0.5 ADC Sequans Beceem	Beceem

Table 29: WAN Device (Continued)

Parameter Name	Description	Range	Default
End Frequency Band	The high end of the frequency band supported by the radio module in Khz.	2360 - 5875	
Frequency Band Name	A descriptive name forthe supportive band		
Hardware Version	The hardware version of the radio module used by the CPE	String of up to 64 characters	
Start Frequency Band	The low end of the frequency band supported by the radio module in Khz.	2305 - 5725	

Table 30: WiMAX Operator Profile

Parameter Name	Description	Range	Default
WiMAX Operator Profile.i			
Subscription Parameters			
EAP Profile Number of Entries	Defines the number of EAP profiles		
EAP Profile.i			
Type	Select the authentication method to be used	EAP-TLS EAP-TTLS EAP-AKA PLAIN-MSCHAPV2 Not Authenticated	EAP-TTLS
Identity	Defines the identity within the selected protocol	String of up to 253 characters	>Empty<
Shared Secret	Defines the password used within the selected protocol	String of up to 253 characters	
Realm	Defines the override realm that is sent in the EAP identity response packet. The identity response is:USERNAME@REALM	String of up to 256 characters	

Table 30: WiMAX Operator Profile

Parameter Name	Description	Range	Default
WiMAX Network Parameters			
Channel Plan Number of Entries	Defines the number of channel plan entries	0 - 1	0
Discrete Frequencies Number of Entries	Defines the number of discrete frequencies entries	0 - 10	1
BS Selection			
Serving BS ID	The BS ID of the base station currently serving the CPE	3 =< Ni =< 255	0.0.0.0.0.0

14. Glossary

ACS	Auto-Configuration Server. This is a component in the broadband network responsible for auto-configuration of the CPE for advanced services.
ACS Discovery	A process by which the CPE locates the correct ACS URL. There are two methods: 1 The ACS URL is pre-set in the CPE. 2 As part of the IP layer auto-configuration, a DHCP server on the access network may be configured to include the ACS URL as a DHCP option [12].
API	Application Programming Interface – An exposed set of methods for integration, allowing access to ACSsupported functionality to external applications (e.g., OSS). In the ACS realm, this interface is aliased NB (northbound).
ATPC	Adaptive Transmission Power Control
CINR	Carrier to Interference-plus-Noise Ratio expressed in decibels (dBs)
CPE	Customer Premises Equipment (e.g., Internet gateway,routers, modems, multiplexers, etc). This is a communication device located at a subscriber's premises through which end user(s) gain(s) connection toward core network.
CPE Profile	A collection of Objects (common settings) for a specific CPE model type.
CPE Update	A process by which the ACS updates the CPE with a new / changed CPE profile.
Default Profile (see also Unknown CPE)	A CPE profile intended for all "Unknown CPEs".
Device Identity	A three-tuple that uniquely identifies a Device, which includes the manufacturer's OUI, serial number, and (optionally) product class.
DHCP	Dynamic Host Configuration Protocol – A network protocol that automates the assignment of Internet Protocol (IP) addresses in any given IP network.
DHCP Server	A DHCP server's main functionality (among others) is to allocate an IP address to each device that requests its service, and ensures that all IP addresses are unique. In the ACS realm, some DHCP servers are also able to supply the ACS URL to the CPE for the "ACS discovery" process (see ACS Discovery).
DSCP	Differentiated Services Code Point – a field in the Internet Protocol (IP) header that specifies the per hop behavior for a given flow of packets
EAP	Extensible Authentication Protocol – a protocol for wireless networks that expands on authentication methods used by the Point-to-Point Protocol (PPP).
FEC	Forward error correction – a method of obtaining error control in data transmission in which the source (transmitter) sends redundant data and the destination (receiver) recognizes only the portion of the data that contains no apparent errors.
Gateway	Internet Gateway Device as defined in TR-069 [1-2].
Gateway Identity	A three-tuple that uniquely identifies a Gateway, which includes the manufacturer's OUI, serial number, and (optionally) product class.

Inform	A procedure by which the CPE contacts the ACS (interval based in CPE or initiated by ACS) to send its parameters. The entire data model is sent on first-time connection; subsequent Inform connections will contain only a select group of Objects (see TR specs).
Individual Parameters	Parameter values that are unique to a specific CPE (e.g., PPP credentials, specific SIP credentials, etc.).
Kick Device	The ACS at any time requests that the CPE initiate a connection to the ACS using the Connection Request notification mechanism. Support for this mechanism is required in a CPE, and is recommended in an ACS.
Kick URL	Present only for a CPE that supports the Kicked RPC method. A LAN-accessible URL from which the CPE can be “kicked” to initiate the Kicked RPC method call. MUST be an absolute URL including a host name or IP address, as would be used on the LAN side of the CPE.
LAN Device	A device which is located "behind" a Gateway / NAT, and supports TR-111, and is thus manageable by the ACS.
Object	A collection of Parameters and/or other objects.
Parameter (see also Object)	A name-value pair representing a manageable CPE parameter made accessible to an ACS for reading and/or writing.
RPC	Remote Procedure Call – A list of available methods on the CPE for facilitating the bidirectional communication between the CPE and ACS.
RSSI	Received Signal Strength Indicator – A signal or circuit that indicates the strength of the incoming (received) signal in a receiver.
Session	A contiguous sequence of transactions between a CPE and an ACS. A session is always initiated by the CPE. The ACS may request a session via "Kick device" method; however, the CPE will commence the actual session.
SOAP	Simple Object Access Protocol – Protocol used for passing data between the ACS and CPE.
SNR	Signal to Noise Ratio – The ratio of the amplitude of a desired analog or digital data signal to the amplitude of noise in a transmission channel at a specific point in time. SNR is typically expressed logarithmically in decibels (dB). SNR measures the quality of a transmission channel or a signal over a network channel. The greater the ratio, the easier it is to identify and subsequently isolate and eliminate the effects of noise.SNR also is abbreviated as S/N.
TR-nnn Protocol	TR-069 is a DSL Forum "CPE WAN Management Protocol" intended for communication between a CPE and Auto-Configuration Server (ACS). TR-069 aggregates a list of sub-protocols, each with its own purpose (e.g., TR-098 for QOS, TR-114 for VoIP, TR- 111 for LAN side devices, etc.).
Unknown CPE	A CPE that has connected to the ACS, but the ACS does not have a specific profile for it.